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by

Dr MARIA MONTESSORI

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PROF. Dr GÉZA RÉVÉSZ AND Dr J.C.L. GODEFROY

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l'Analisi.

Dr. M. MONTESSORI.

La presente lezione [1]) è per dimostrare il procedimento che deve seguire il nostro metodo specialmente nel periodo avanzato.

Intendiamo per analisi una separazione dei vari elementi che si trovano riuniti insieme in ogni apprendimento complesso. Questi elementi sono per lo più di vario grado. Quasi sempre si trovano parti riferentesi alla sfera sensoriale o motrice se si tratta d'una cosa che ha qualche possibilità d'applicazione pratica, e insieme vi vanno uniti elementi puramente razionali; ovvero l'elaborazione creativa è chiamata in giuoco.

Le „difficoltà" dell'apprendere sono per lo più dovute al fatto che spesso questi vari elementi, agiscono da ostacoli l'uno verso l'altro. Analizzando allora gli elementi, si trova che talvolta la „difficoltà" è proprio dovuta a osta coli d'ordine del tutto inferiore —: anzi si può dire che l'origine principale della fatica e del tedio che i fanciulli provano avanzando negli studi — è dovuta a ciò, che elementi d'ordine inferiore, ma indispensabili, non furono sviluppati prima e l'individuo deve sopportare la „fatica di tornare a ritroso nell „età infantile" e preparare fuor di tempo l'elemento indispensabile a far avanzare l'intelligenza ragionatrice e creatrice, che troverebbe appunto „facile" il camminare rapidamente e senza ostacoli lungo il piano superiore a cui è giunta per naturale sviluppo.

L'aneddoto tanto ripetuto nella scuole italiane, di Vittorio *Alfieri*, rappresenta una esagerazione del fatto comune che si trova in tutte le scuole secondarie e anche spesso nella stessa Università. L'Alfieri è l'uomo che *vuole* dare possibilità d'espressione al genio letterario che scopre molto tardivamente in se stesso. Egli deve allora „ricominciare" e superare molte difficoltà dell' apprendimento elementare, che sono più dure per lui che per un bambino —;

[1]) Lezione alle maestre (Londra, 1925).

poichè il bambino le supera con sacrifici infinitamente più lievi. L'eroico sforzo che l'Alfieri si è „addossato", di rimanere costantemente a studiar tutto da capo, è una vera e propria retrocessione nella fanciullezza. Poichè la „fatica di comporre poemi" non è fatica pel suo genio: ma è fatica il non „potersi esprimere". L'esempio è ben trovato per animare i ragazzi a usare pazienza, e a procurarsi per pura forza di volontà una costanza artificiale nei loro studi — poichè questi studi, benchè in minor grado, sono irti di quelle medesime difficoltà: c'è qualcosa nella energia interna che vorrebbe correre verso più alti confini — ma l'anima è costretta a far lo sforzo di rimanere in basso — e compiere tardivamente una arida preparazione.

Col nostro criterio dell' analisi si viene appunto a toccare tale scoglio degli studi avanzati. È già un progresso pratico „separare l'un dell'altro glielementi componenti quando sono di vario grado." Per il fanciullo il constatare che gli manca qualcosa di semplice che bisogna acquistare per poter riuscire bene nel lavoro intelettuale più alto, è una conquista importantissima. Essa apparisce come una liberazione della intelligenza — la quale intravede che, superato a parte l'ostacolo — tutto procederà trionfalmente e senza fatica.

Il caso opposto — che cioè si metta dinanzi al fanciullo un elemento intellettualmente troppo elevato, è assai raro — e quasi trascurabile nella pratica. Infatti l'intelligenza immatura non può giungere verso una cosa che esce dai suoi confini — e ben presto la pratica ha compiuto un necessario lavoro d'eliminazione. Il contrario però rimane e può rimanere all' infinito, consumando le migliori energie dell'intelligenza — perchè può fare apello „allo sforzo volontario" — al „sacrificio" — e cosi trattenere le energie superiori in un piano meno elevato.

Basti pensare all' esempio più classico di questo fatto — che è la composizione, la creazione lettararia dei bambini: — Tutto quello che riguarda la scrittura in se stessa (calligràfia) — la ortografia — la grammatica — accompagna talmente la composizione, che questa ne imane soffocata: — e ciò che sarebbe puro lavoro creativo — è riassorbito nello sforzo di curare studiosamente elementi di ordine

inferiore o di natura addirittura meccanica, che potrebbero essere superati a parte o in tempi diversi.

Se invece si può liberare il lavoro creativo, separandolo da *elementi preparativi* o di perfezionamento — esso potrà non solo progredire sensibilmente più che d'ordinario, ma potrà veramente portare in sè delle impronte originali ed innovatrici. Gli elementi preparativi, separatamente svolti (ortografia ecc.) portano a perfezionare la composizione quando questa a poco a poco si rinuovi in un individuo fatto più colto; senza però mai toccare direttamente ai frutti della sorgente creativa. Infine, si corregge e si perfeziona *l'uomo*, non la sua composizione letteraria. Il fanciullo o in età precedenti — o in momenti molto diversi da quelli dell' ispirazione, potrà esercitarsi nell' aprendere regole e leggi, che possono anch' esse avere il loro interesse — tanto più se si presentano allo spirito come un *aiuto a prendere cio che manca* — anzichè come un ostacolo alla gioia del creare — o del pensare.

L'analisi è dunque una separazione di elementi di vario grado. Questa separazione ha però dei *caratteri* che è bene intendere fin dal principio. Noi separiamo gli elementi che possono costituire per se stessi un esercizio interessante. Se l'analisi fosse una separazione puramente teorica, essa non porterebbe grande progresso alla pedagogia — perchè l'„interesse" deve rimanere il *fulcro* d'ogni altività spontanea. Ora sembrerebbe che una analisi dovrebbe essere appunto in contradizione con l'interesse.

Le parti separate di una cosa, infatti, — sono in se stesse meno interessanti della cosa completa. Per di più può sembrare che in un esercizio complessivo ove stanno mescolati elementi diversi, quelli fra essi piu adatti al bambino, possono costituire come un fulcro centrale dell' interesse, capace di trarsi dietro anche gli altri elementi, mascherandone l'aridità.

Per esempio — arrivare a comporre è un interesse cosi grande, che fa superare molte noie e fatiche ortografiche o grammaticali. Ma non è cosi. La „purificazione d'un grande interesse", vuol dire intensificare l'interesse stesso. La composizione senza preocupazioni d'altro genere, sarà infinitamente più interessante che una composizione *legata a* regole e soggetta a critiche riguardanti fattori estranei

alla sua vera essenza di espressione del pensiero. — Venuto un interesse centrale-allora esso si reflette anche su altri elementi concomitanti: e l'autore, ciòè il bambino, cerca „gli" esercizi capaci di rendere sempre più perfette le sue libere creazioni. Da un interesse principale nascono interessi collaterali — che aiutano a sostenere il sacrificio di sforzi anche notevoli. Abyssus, abyssum invocat.

La confusione di elementi è dunque un fatto contrario al sorgere degli interessi, e non viceversa. L'analisi è proprio per eccellenza un procedimento che *favorisce* il sorgere degli interessi.

Noi però non dobbiamo fondarci su questa specie di „collegamento" d'interessi: ma cercare di separare gli elementi l'uno dall' altro, inquadrandoli ciascuno in un esercizio attraente e completo in se stesso. Assai aiuta a far capire l'idea, l'analisi chimica . . . Quando si dice che l'aqua è analizzabile in due elementi: ossigeno e idrogeno — non intendiamo di dire che i due elementi siano „un brano di acqua" come sarebbero, per esempio, dei petali distaccati, nell' anatomia di un fiore. L'idrogeno e l'ossigeno — non sono acqua; ma ciascuno è un corpo che può esistere per se stesso ed ha caratteri propri. Non solo, ma quegli stessi elementi possono combinarsi in altri composti, come p. es. gli acidi. —

Ora, quando parliamo d' „analisi" intendiamo questo criterio — e non il criterio anatomico, che è una separazione di parti non aventi la capacità di esistere per se stesse, *Ogni elemento deve costituire un esercizio interessante,* che può avere un progresso indipendente dagli-altri elementi. Tale „liberazione" ha cosi grandi vantaggi pratici, che non si può farne rilevare facilmente tutta l'importanza. Basti qui accennare due cose: la prima è che separando gli elementi, questi si possono trovare adatti a *età diverse* — e costituire basi o fondamenti successivi, i quali preparano l'uno all' altro lo svolgimento, anzichè ostacolarsi reciprocamente.

L'altra è che alcuni elementi *richiedono* una quantità d'esercizio notevolmente maggiore di altri — e restano ancora *„imperfetti"* quando altri si sono già perfezionati. La loro tardiva formazione richiede perciò l'inutile repetizione contemporanea d'elementi già perfetti, che sono perciò *trattenuti* indietro. La fatica del ripetere il solo elemento richiedente più lavoro è attenuata col fatto di non

trarsi dietro necessariamente l'opposto lavoro di trattenere lo slancio in avanti degli elementi già perfezionati.

Dicevo comminciando questa lezione, che essa avrebbe *avuto* lo scopo d'illustrate il principio dell' analisi. — E prendo come tema quello della musica. Io non farò che accennare ai procedimenti pratici, senza più dilungarmi in esposizioni teoriche.

* * *

Partiamo da due fondamenti già preparati nelle „Case dei bambini".

Uno è di ordine sensoriale: Fra i vari esercizi dei sensi, i piccoli bambini avevano imparato a riconoscere i suoni della scala cromatica — distinguendo a due a due le campane che, battute, dànno lo stesso suono (appa iamento delle identità); — e anche sapevano riconoscere la successione dei suoni in modo che a orecchio sapevano mettere in ordine le campane, che prima erano mescolate e confuse insieme.

Un altro fondamento è d'origine motrice e voglio alludere a quegli esercizi che i piccoli bambini fanno per acquistare il sicuro equilibrio del corpo e perfezionare il modo di camminare. — Non ho bisogno di descrivere questi esercizi: essi consistono nel porre i piedi, come fa il funambolo che cammina sulla corda, sopra una linea disegnata sul pavimento. Gli esercizi successivi di tenere in mano, camminando, ora una bandierina che mai deve abbassarsi, o un bicchiere pieno d'acqua che mai deve *versarsi*, o un campanello che mai deve suonare — sono sempre appartenenti agli esercizi di perfezionamento della deambulazione nell' acquisto dell' equilibrio e nel controllo di tutti i movimenti.

Su questi due fondamenti, sensoriale e motore, vediamo ora come si erige l'edifizio di un primo apprendimento della musica.

A. *La musica in se stessa.* — Prima di tutto occorre produrre musica intorno al bambino (influenza educativa dell' ambiente) — affinchè possano rimanere nella sua memoria delle frasi musicali corrette, in qualsiasi modo apprese.

Egli cercherà di riprodurre delle armonie, se avrà a sua portata istrumenti musicali abbastanza semplici, da non richiedere una speciale tecnica nell' uso: come le campane stesse o un primitivo

istrumento a corda o a tubi risuonanti, dove il fanciullo può cercare di riprodurre un' armonia, o degli accordi — esercitandosi da solo. — Questo può condurlo a un entusiasmo, (il vivo interesse), se l'ambiente avrà offerto al bambino una musica adatta al suo gusto, e se egli potrà avere il compiacimento di suonare un vero istrumento, in modo da riprodurre correttamente delle frasi musicali.

B. *La lettura e scrittura.*: Tutt' altro esercizio è quello della lettura e scrittura della musica. Esso può interessare per se stesso tanto più, per quanto più l'interesse alla musica è vivo — e per quanto più la scrittura e lettura non viene a interferire direttamente sugli esercizi musicali. Loro già conoscono i mezzi che diamo al bambino perchè egli possa „da solo", imparare le note nella loro posizione sul rigo. Prima di tutto si pone un *dischetto* col nome della nota sul piede di ogni campana che ha servito all' esercizio sensoriale primitivo — e cosi il nome della nota è associato al *suono* già ben noto all' orecchio.

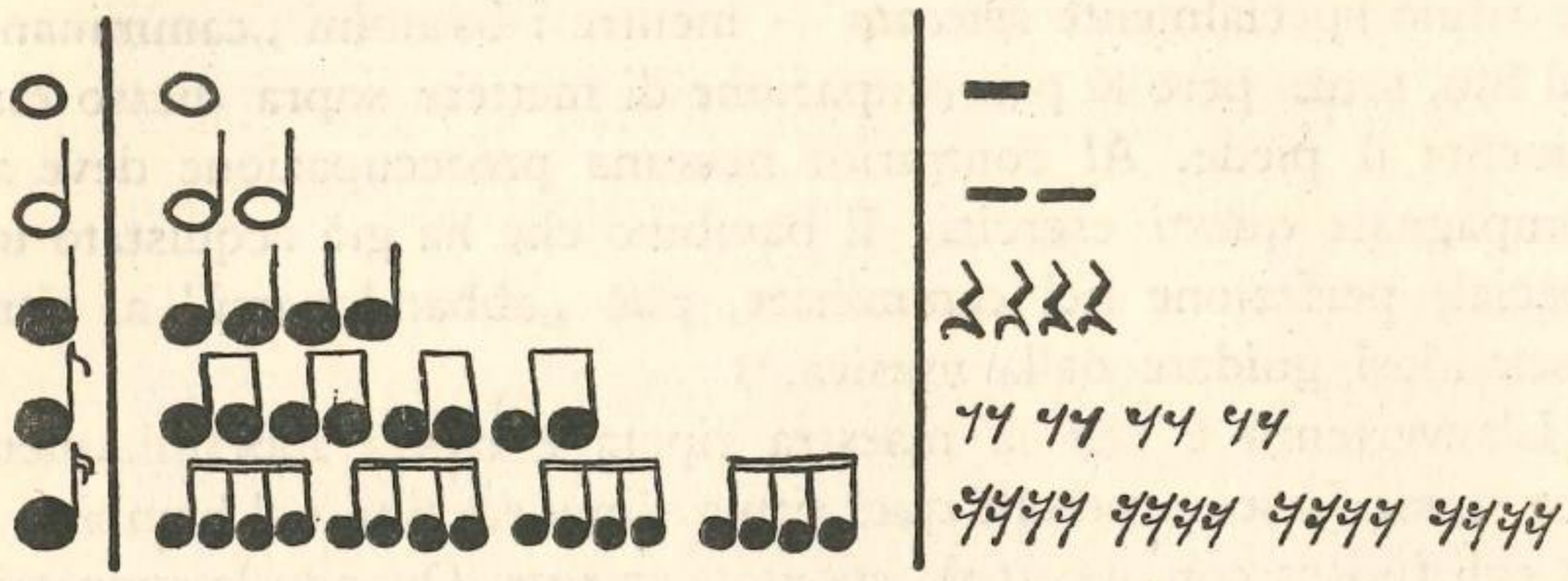
Dopo i dischetti si pongono a incastro nel rigo di legno, *dove* delle incisioni rotonde, che portano sul fondo scritto il nome della nota, indicano il posto delle varie note; e il bambino infilandole e sfilandole, può memorizzarne la posizione senza che intervenga l'aiuto del maestro.

In un altro materiale c'è un rigo inciso su legno o disegnato sopra un cartone, sul quale si possono disporre moltissimi dischetti, leggendo il loro nome — e ponendo il disco nel posto dovuto — in modo porò che il nome resti della parte inferiore, cioè nascosto.

Finito l'esercizio di collocare i dischetti, il rigo è tutto cosparso di dischi bianchi. Allora questi si rivoltano senza cambiarli di posto e si controlla se furono collocati correttamente: se tutti quelli che hanno lo stesso nome si trovano quindi allineati sulla stessa riga o lungo il medesimo spazio.

Un altro materiale consiste nei due righi, che si dispongono l'uno presso all' altro. dall' alto in basso.: e le note, andando dal *Do* sotto il rigo fino al *Do* dell' ottava superiore e ridiscendendo, formano un angolo nel rigo superiore — e uno analogo, ma in senso opposto si costruisce nel rigo inferiore, disegnan, do complessivamente un rombo. Quando si separano i due righi, le note vengono a trovarsi disposte secondo le due chiavi di violino sopra e di basso sotto.

Un altro materiale d'apprendimento di lettura è quel quando che rappresenta il valore relativo delle note — e il silenzio che corrisponde ai loro segni.



Tutti questi esercizi d'apprendimento e di memorizzazione potendo essere fatti senza maestro, il bambino li praticherà senza dubbio allorquando un interesse lo spinge od usare i materiali. Studierà egli tutti gli esercizi, o solo una parte di essi, prima d'applicarli alla musica? Questa è cosa che riguarderà il bambino.

Lettura:

L'ambiente gli offrirà più tardi dei cartelli che il fanciullo può scegliere — su cui sono segnate delle note senza chiave e senza tempo — ma semplicemente la successione di note sul rigo — e il bambino può allora procedere alle sue prime letture di semplici melodie — o sulle campane o sugli istrumenti a corda — e spesso pure ai suoi primi tentativi di cantare le note che sono accessibili ai suoi organi vocali.

Questi primi esercizi di lettura possono essere contemporanei agli esercizi di scrittura. Il bambino ha dei fogli con righi più grandi della rappresentazione comune; su d'essi può scrivere le note che ha trovato riproducendo melodie sugli istrumenti.

Cosi musica e scrittura s'incontrano — ma non si sono mai ostacolate, perchè ebbero nascimento e sviluppo indipendente.

C. Il ritmo: — Andiamo ora a un altro elemento. Col ritmo riscalta il *tempo*, la durata ciòè dei singoli suoni, e il loro compasso. Anche qui, primo punto di partenza necessario è *l'ambiente* che

produca intorno al bambino una musica adatta a realizzare il suo sviluppo musicale.

Noi dunque facciamo suonare delle frasi musicali che abbiano un ritmo specialmente *spiccato* — mentre i bambini „camminano" sul filo, senza però la preoccupazione di mettere sopra diesso esattamente il piede. Al contrario: nessuna preoccupazione deve accompagnare questi esercizi. Il bambino che ha già acquistato una speciale perfezione nel camminare, può „abbandonarsi" al ritmo lasciandosi guidare dalla musica. [1])

L'avvertenza è che la maestra ripeta e ripeta indefinitamente una stessa frase — perchè quel ritmo s'immedesimi nel bambino — ed egli finisca con avvertirlo spontaneamente. Quando la suonatrice si accorge che qualche bambino cammina ritmicamente in rapporto con la musica, essa sa che qualche altro elemento si sta maturando nel piccolo camminatore. Il senso del ritmo è nato, e si è espresso nel movimento di tutto il corpo.

Questo è il fatto fondamentale.

Diamo allora ai bambini, giunti a questo periodo, dei tamburini o altri istrumenti che diventano mezzi piacevolissimi per loro a segnare il tempo, battendoli mentre caminano, e fissando con tale esterna manifestazione, la conquista che in essi à nata.

Quando il bambino si è fatto sensibile al ritmo — non è più necessario di ripetere lungamente la medesima frase musicale — e tanto meno è utile avere istrumenti con i quali segnare il compasso. Tali particolarità sono utili solo nel periodo passeggero in cui il fatto si stabilisce. Dopo è invece interessante cambiare spesso le frasi musicali con lo stesso o con diverso ritmo — e dare al bambino la possibilità di esercitarsi a riconoscere il tempo e di adattarvi i movimenti ritmici.

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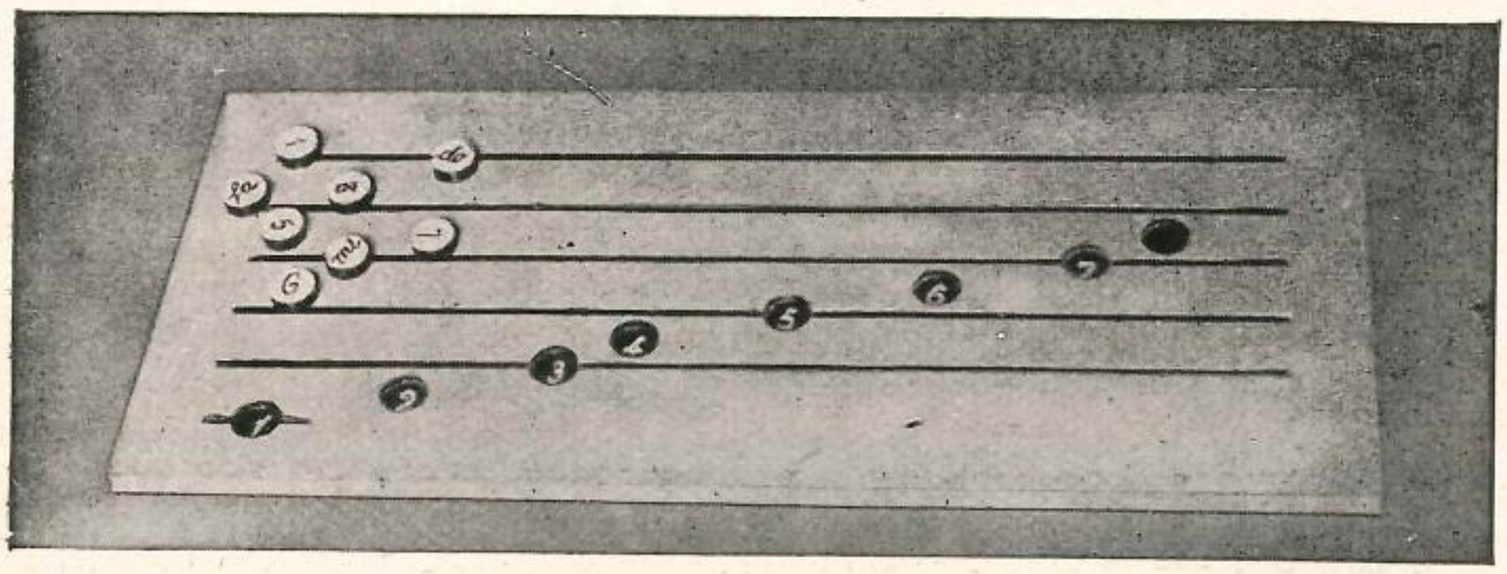
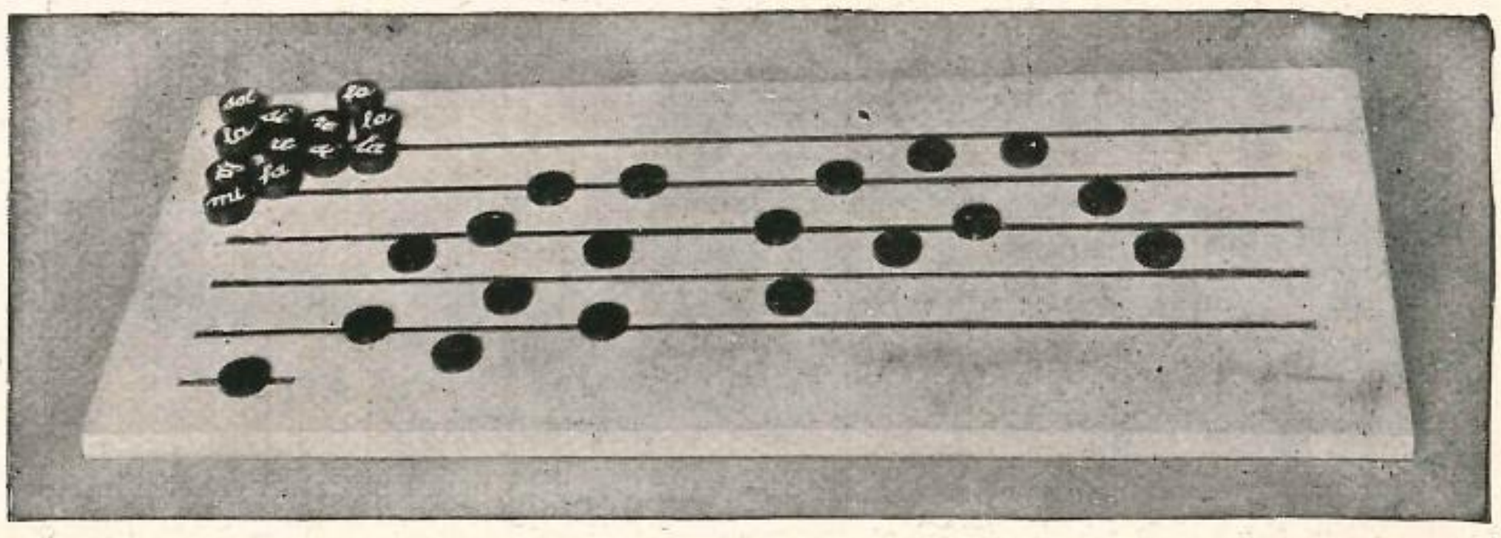
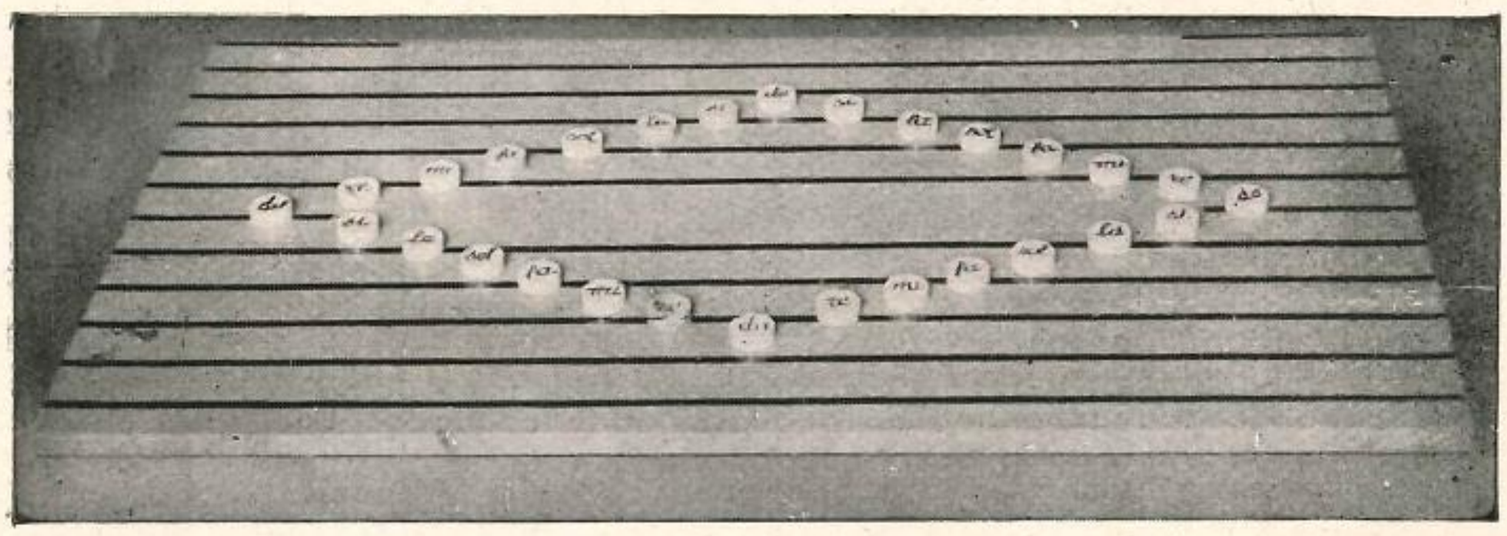
[1]) La scelta delle frasi con le quali iniziare gli esercizi ritmici, ha uma importanza grandissima: e per questo occorre fare delle raccolte di brani musicali e sperimentarle sui bambini prima d'offrirla come una „parte dell 'ambiente" educativo. Dopo il primo inizio dato dalla signorina Maccheroni — si raccostero nelle nostre scuole due serie di frasi e di brani musicali: uno a Barcelona per cura dei professori Angles e Gibert e un altro per cura di L. Benjamin, a Vienna il cui lavoro di ricerche uscirà presto alle stampe: (L. Benjamin: „An introduction to music for little children").



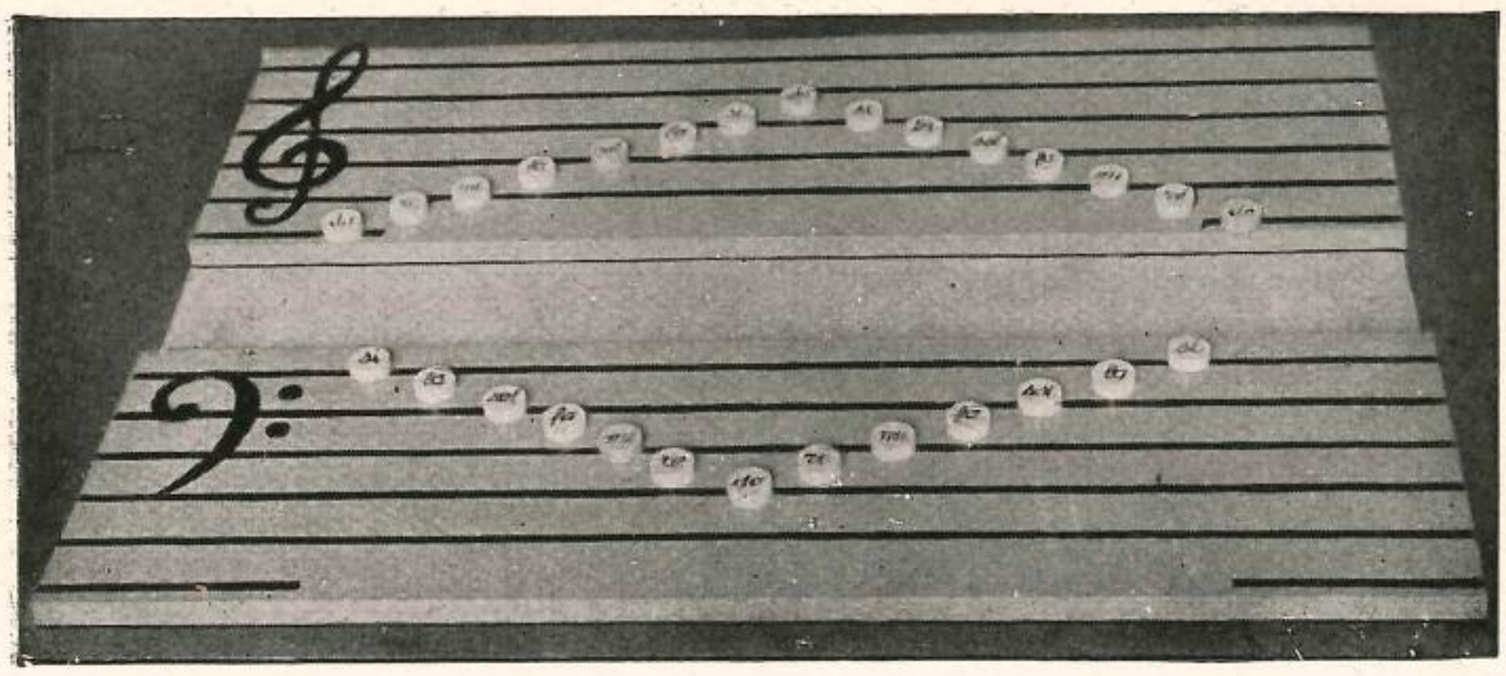
A wooden board with round spaces cut out corresponding to the notes.



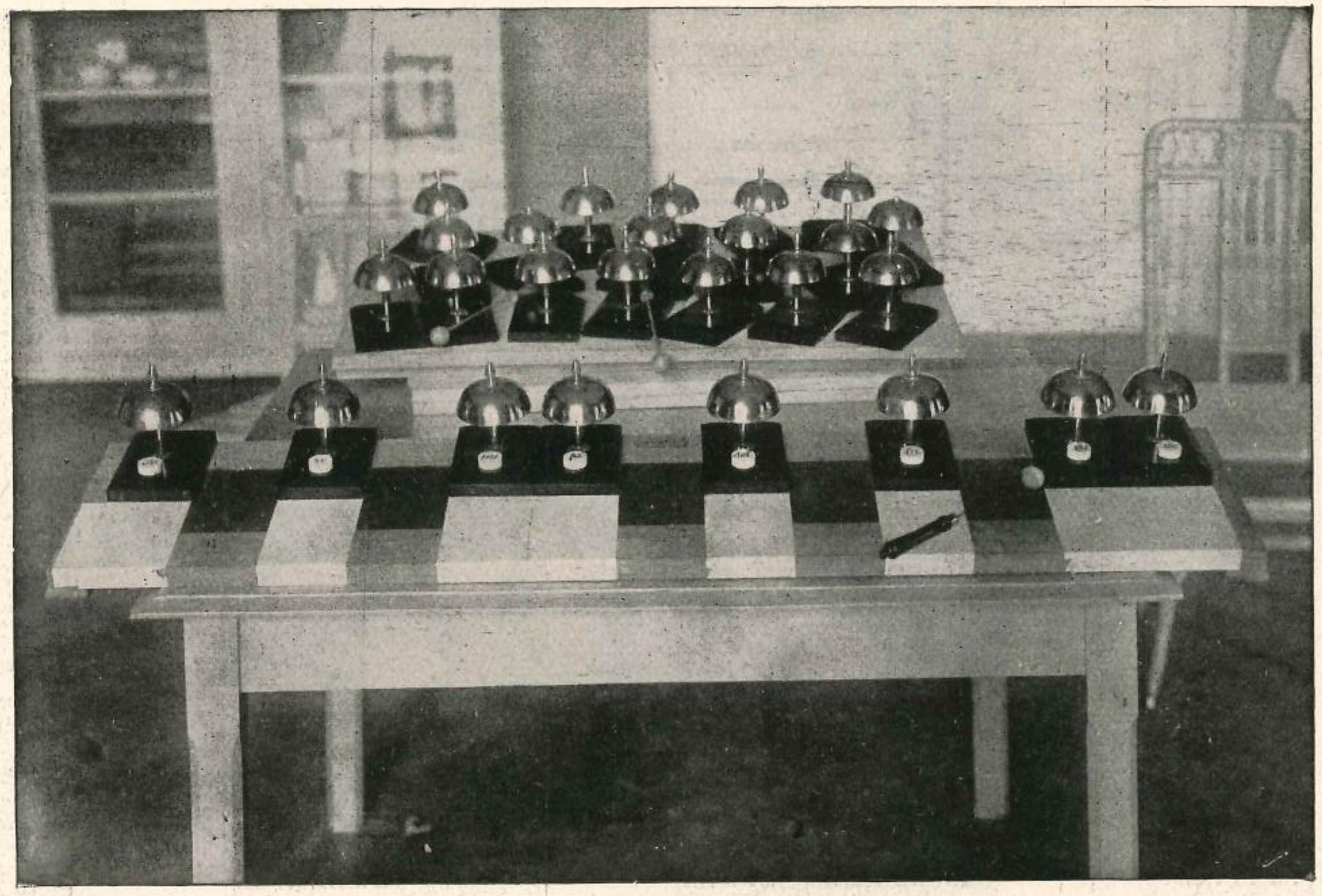
The board with the discs representing the notes.



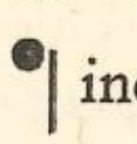
The double staff formed by putting the two boards together. The children arrange the notes in the form of a rhombus.



The two boards separated and arranged as treble and bass clefs.

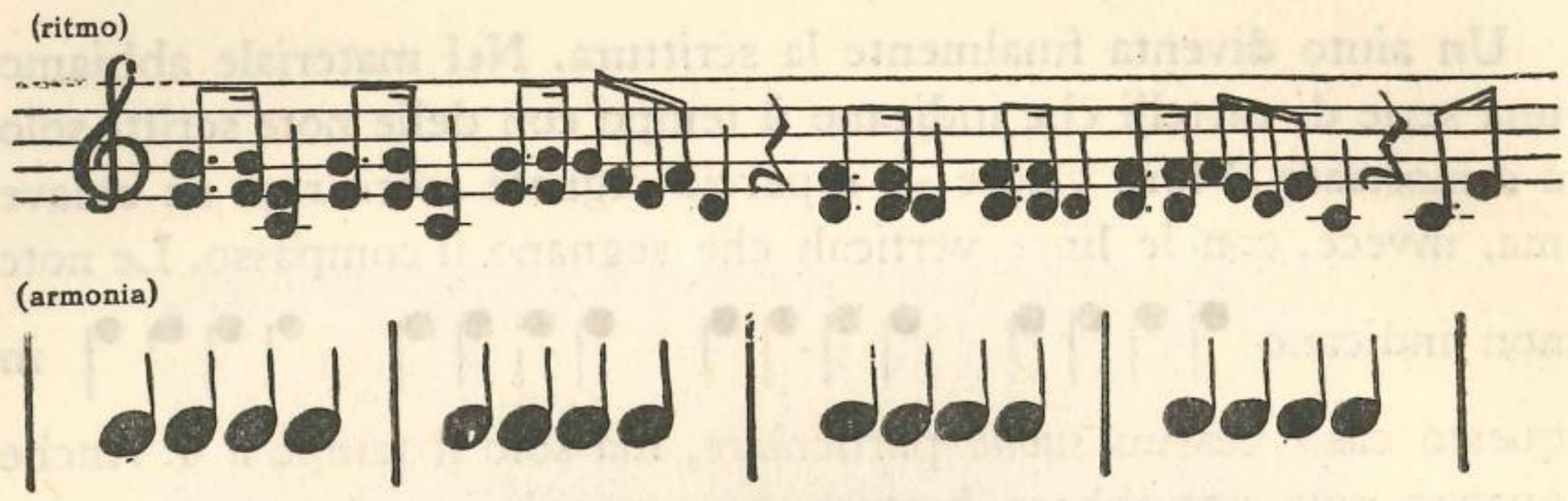


Musical Bells.

Un aiuto diventa finalmente la scrittura. Nel materiale abbiamo una serie di cartelli che indicano il tempo con delle note scritte solo a dimostrare il loro valore — e perciò segnate *senza* rigo nè chiave ma, invece, con le linee verticali che segnano il compasso. Le note non indicano in questo caso nessun *suono* particolare, ma solo il tempo a 4. Anche quattro note potrebbero bastare, se non volesimo dare una visione più comprensiva dei tempi successivi: ; e, infine, il numero 4/4 può significare la stessa cosa, sa pendo che il segno  indica 1/4 del tempo della nota iniziale: o

Altre tavole indicano i diversi ritmi, ai quali corrispondono le forme di marcia, corsa trotto, salto ecc. Negli esperimenti fatti a Barcelona col Prof. G i b e r t avveniva che i bambini, altre a interpretare spontaneamente con grande finezza i diversi ritmi, — spesso si staccavano dalla marcia per andare a segnare sulla lavagna una serie di note diverse secondo il tempo. In questo periodo dello sviluppo, lo studio della „scrittura" delle note secondo il tempo — i segni delle pause il valore relativo delle note ecc. può essere uno dei tanti studi individuali che il fanciullo compie lavorando isolatamente.

Ecco dunque due diverse specie di lettura e di scrittura: quella della melodia o dell' accordo armonico — e quella del tempo — separate d'una dall' altra. La prima si rappresenta col segnuirsi delle note nel rigo — la seconda con una serie di note che simboleggiano unicamente il valore del tempo e che, scritte senza rigo nè chiave, possono infine riassumersi con una formula di frazione numerica. Le due scritture riferentesi a una medesima frase musicale, possono porsi una accanto all'altra e rappresentano *l'analisi* nello studio della musica. In rapporto ad'una cosa si portà svolgere l'abilità di riprodurre suoni con un istrumento musicale o con il canto; e in rapporto all 'altra può svolgersi una completa ginnastica ritmica e il ballo.



La sintesi:

Tutte e due le cose però, armonià e ritmo, sono in realtà fuse in una sola cosa: — e quando il bambîno cerca in seguito a orecchio nei suoi instrumenti una melodia, può scriverla compiutamente scrivendo le note non solo riguardo alla loro posizione, ma anche al loro valore. Anche la lettura della musica si rende allora completa: e l'ostacolo degli inizi è superato — seperando in differenti esercizi difficoltà di ordine diverso: — la musica melodica — la scrittura — el il ritmo.

La cosa però essendo una, tutti gli elementi si ricompongono insieme — suscitando con ciò l'interesse che conduce al progresso successivo.

D. L'elemento separato. Se il ritmo fa parte della musica solo come valore di tempo — dei varii suoni — esso non dovrebbe appartenere solo alla musica, ma a tutto ciò che si dispiega con regolarità e con misura nel tempo. Il — *ritmo* — fu chiaramente distaccato dall'armonia — e le due scritture ne rimanevano l'espressione visibile.

Leggendo una poesia, si ha un fenomeno analogo a quello della musica: una serie di suoni si seguono ritmicamente. La metrica, infatti, studia il ritmo poetico — e lo separa dell' armonia degli *accenti*. Leggiamo dunque delle poesie scegliendole, come si fece per la musica, — e lasciamoci abbandonare alla cadenza del loro ritmo, anzichè lasciarci affascinare dall' armonia del verso o dal senso delle parole. Ciò potrà fare più facilmente di noi il bambino, che sente il ritmo della poesia assai prima di gustarne il verso o di comprenderne il significato.

Facciamo, durante la lezione una prova, leggendo in lingua inglese, in lingua italiana e in lingua tedesca dei versi esametri e ottonari. Ne risultano un trotto, il salto e varie specie di marcia.

Questo può sembrare a molti una pura curiosità o forse una offesa alla poesia, ma noi abbiamo invece cosi iniziato lo studio della metrica, facendo *sentire* il verso prima di misurarlo: — l'analisi ha introdotto lo studio della metrica in un età precoce ai bambini, ove l'esercizio può revestirsi ancora con un bell' abito d'interesse. —

È', come dicevo, un fatto analogo all' analisi dell' acqua in ossigeno e idrogeno, quegli elementi non devono nesessariamente far parte dell' acqua, me possono anche entrare in composti diversi.

E separando il ritmo dell' armonia-possiamo poi collegarlo con la poesia; come nei nostri esercizi analitici della scrittura, separando uno dei movimenti e inquadrandolo nel disegno — abbiamo preparato la mano non solo a scrivere, ma a seguire con sicurezza ogni atto coordinato, facendo la mano obbediente anche all'ispirazione artisticà.

Analysis

by

Dr. MARIA MONTESSORI.

The present lesson is to show the way of proceeding to be followed in our method during the advanced period.

By analysis we mean the separating of the various elements which are found united in every studial complex.

These elements are for the most part of various grades. Almost always, when we have to do with a matter at all capable of being practically carried out, parts of the complex are concerned with sensorial or motor activities; united with these are elements of a purely rational kind; or creative elaboration may be called into play.

The „difficulties" found by the learner are almost always owing to the fact that these various elements often serve as mutual hindrances.

By analysis then of these elements, we find that sometimes the „difficulty" is actually derived from obstacles of a quite inferior order. We may go further and even say that the chief cause of fatigue and borcdom in the child as he advances in his studies has its explanation in the following fact: Elements of inferior order but in themselves indispensable have not previously been developed, with the result that the individual has to undergo „the fatigue of a return to the age of infancy"; — he is obliged, at an age when he is no longer equipped for such preparation, to prepare an element which is nevertheless indispensable to him if he is to advance in intelligent nse of his reasoning and creative powers. Had this preparation been done at the age when it was fitting, the intelligence of the child would have found it easy to advance, swift and untrammelled, along his path of progress, on the superior plane that it had reached by natural development.

The story of Vittorio Alfieri, so often told in Italian schools, re-

presents in an exaggerated form a common fact such as we meet with in all secondary schools and often in the university itself. Alfieri is the man who *wills* to afford possibility of expression to the literary genius which so late in life he has discovered within himself. He has then to „begin over again" — to overcome many difficulties in studies of an elementary kind. These difficulties are greater for him than they would be for a child! for the child overcomes them with a much less strain of sacrifice. The effort, heroic and self-imposed, of Alfieri, forcing himself to persevere in studying everything from the beginning, is a veritable re-entrance into childhood. For genius, the „fatigue" of composing poems is no „fatigue"; but it is „fatigue not to be able to express oneself". Alfieri's example is just the thing to incite children to use patience, to stimulate them to make themselves persevere — artificially — by sheer force of will — in their studies. For the children's studies are thickset with the same difficulties, though in a less degree. In his inner energies stirs something which would fain mount upward. But the soul finds itself constrained to put force on itself and keep on the lower plane, carrying out there its task of preparation begun long after the propitious moment — a task which under the circumstances cannot fail to be dry and burdensome.

With our criterion of analysis we can lay our finger on this obstacle to advanced studies. It is already a step of no small practical value which we achieve by separating these component elements of various grades. The realisation that he lacks something simple which he has to gain if he is to advance further in his mental work — this realisation is a most important gain for the child. He dimly perceives that having dealt singly with this obstacle and overcome it, he will proceed triumphantly on his way without fatigue.

The opposite case to that considered by us: — the case where the child finds himself up against an element of too high an intellectual order — is very rare. In practice it is almost entirely negligeable; an immature intelligence cannot reach a thing outside its own confines; very soon practice will perform the necessary elimination. But the case we have considered does exist, and may do so

ad infinitum; one may appeal to the learner to make „an effort of the will" to „try very hard" — and by so doing keep back the higher energies upon the lower plane.

It will suffice if we think of the standard example of this fact — I mean *composition;* the literary creation of the child. All that has to do with writing in itself (calligraphy) — spelling — grammar — is in such close conjunction with composition that the latter is choked by them. An effort which ought by rights to be a purely creative one is overpowered by the strain of preparing elements of an inferior order or that have even to do with mere memorising; such elements as could well be mastered apart and at different times from this.

But if the creative activity can be given free way, if we can separate it from other elements of a preparatory or of a perfective kind, it will then be capable of striking, nay exceptional progress; and will have on it the seal of a real innovation, be invested with the character of something original — the preparatory elements (spelling etc.) worked out separately will tend little by little to the perfecting of composition, as the composer little by little advances in culture; but the fount of creation will be free to rise untroubled from its source. In short, we shall correct and perfect the *man* rather than the *composition.* Rules and laws can be learned by the child either at an earlier age or at quite other moments than those when he is seized by inspiration. Such rules and laws, interesting in themselves, will be all the more so if they reveal themselves to him as a help to a felt need rather than as hindrances to the joy of creation — to the joy of thought.

Analysis is therefore a separating of elements of different grades. Certain facts characterizing this separation should be grasped from the first. We separate from the rest such elements as can constitute in themselves an interesting exercise. Now, were this analysis a purely theoretical separating we should hardly have made thereby a very great pedagogical advance; for after all it is „interest" which represents the fulcrum on which all spontaneous activity turns. And it would seem as if *analysis* must be at the opposite pole from *interest.*

True, the separated parts of a thing are in themselves less interesting

than the whole. It may seem, moreover, that in an exercise embracing and incorporating diverse elements, the elements best suited to the child may constitute as it were a fulcrum, a centre of interest, sweeping up into themselves all the other elements, charming away for the learner all sense of their aridity. It is, for instance, so interesting a thing to arrive at composing, that this very interest helps one over many hard tiresome turns of spelling and grammar. But the matter is not so simple — „The purification of a great interest" is the intensifying of that interest. Composition freed from extraneous preoccupations — composition for its own sake — will always be infinitely more interesting than composition bound by rules, composition liable to be attacked by criticism quite alien to its essential nature. What is the essence of composition if not that it should express thought?

When a central interest has once been formed, this sheds its glamour over the other concomitant elements; and it is the author, i.e. the child, who will seek for such exercises as may perfect the creations he has freely conceived. There will spring from one principal interest others collateral with the first; that tend to make him persevere in work which often represents for him considerable strain. Deep calleth into deep.

It is, then, the confusion of elements which wars against the rise of interest; not vice-versa. Analysis is really the very best of all possible means to favour the rise of interest. It is not, however, a kind of linking up of interests that we use as our basis; we must try to separate the elements, embodying each in a single exercise, attractive and complete in itself.

To elucidate this idea, the example of chemical analysis will greatly assist us.

When we say that water is analyzable into two elements, oxygen and hydrogen, we do not mean to say that these two elements are each „a bit of water" — in the same way that the detached petal of a flower is a bit of that flower, or as in anatomical dissection. Hydrogen is not water, neither is oxygen. Each is a body capable of

existing alone and possessing its own characteristics; besides which, each can enter into other compounds, such as acids, etc.

Now when we speak of analysis, this is what we mean. Not the anatomical idea, a dissection into parts incapable of separate existence.

On each element we must base an interesting exercise, whose line of progress is independent of the others.

This „liberation" has such immense practical advantages that it would be difficult to overrate their importance. It will suffice here to mention two things: the first is that this separation of the elements allows them to be studied at different ages, thus forming successive bases or foundations which will mutually further instead of hindering each other's development.

The other thing is that some of these elements exact a much greater amount of practice than others. Some of them will be still in a state of imperfection when others have already been „perfected": Thus supposing they were late in formation, there would be a need of their repetition, carried on side by side with that of elements needing no repetition; the latter being already perfected but in this way hindered or kept back by the others. Fatigue is lessened by specialising on the single element requiring repeated exercise; for such socialised effort does not involve at the same time the contrary effort of holding back such elements as have already rea-
exactly ched their perfection.

I stated at the beginning that I aimed at illustrating the principle of analysis. As an illustration, I will now take the subject of music. I shall point out practical ways of proceeding, no longer dwelling on the exposition of theory.

We will start from two fundamental facts already prepared in the Casa dei Bambini.

One of these fundamental facts is of a sensorial order. Among the various operations of the senses, little children learned to recognise the component sounds of the chromatic scale, picking out the bells which, when struck, gave the same sound (pairing of identical sounds); they could also recognise the pitch order and could by ear

place the bells in orderly succession after these had been previously mixed up.

Another of these fundamental facts has to do with motor activity. I am referring to those exercises which the children do to get sure of their balance and improve their walking. I need not describe these exercises; they consist in placing one's feet as the walker does along the tight-rope — along a line traced on the floor. With these walking exercises for gaining balance and controlling all the movements are associated other successive exercises. As they walk, the children hold in their hands various objects: a flag that must be always kept floating, a glass full of water that must never spill, a little bell that must never ring.

On these two foundations — sensorial and motor — we build up the beginning of musical study.

A. Music in itself. First of all we must have music played in the presence of the children (educative influence of the environment) so that — however he learns them — he may have to keep in his memory correct musical phrases.

If the child has at hand musical instruments of sufficient simplicity, that is, such as do not require a special technique in playing, he will try and reproduce these harmonies. We may give him the bells we use in the method, primitive stringed instruments, pipes. On these he may try to play the harmonic phrase or the chords that he has heard, and practise them by himself.

If the music he hears around him is to his taste, and if he can have the satisfaction of trying a real instrument which can correctly reproduce musical phrases — enthusiasm will follow.

B. Reading and writing. The reading and writing of music is quite a different exercise. This may inspire interest for its own sake, all the more so if there is a lively interest in music already and if the writing and reading do not directly interfere with the musical exercises.

You already know the means we afford the child of learning for himself the notes in their position on the stave.

First of all we place a disc with the name of the note at the base

of each of the bells which have served in the primitive sensorial exercise; thus we associate the name of the note with the sound already familiar to the ear.

After this the dises are inserted in their appropriate spaces on the wooden stave; these spaces are round, they are sunk in the board and each having written in it the name of a note indicate the place of that special note. The child putting them in and taking them ont can then learn by heart the position of the notes without the help of the teacher.

Another part of the didactic apparatus is a stave whose lines are cut in wood or drawn on cardboard. On this stave can be placed a great number of dises. The child reads their names and puts each in its right place — the name being on the under side and so hidden. When all these white discs are placed, and the stave is covered with them, we turn each disc without moving it from its place. Thus we can verify and see whether the discs are placed correctly — whether, that is, all of those having the same name are found to be or not to be placed on the same line of the stave.

Still another part of the material consists of two staves arranged one below the other. The notes, ascending from C below the stave to high C and descending again — make an angle on the upper stave which is reversed on the lower stave, forming a rhombus.

When the two staves are separated, the notes are found to be arranged according to the treble or bass clef.

Another part of the material for learning to read is this table showing the relative time-value of notes, with the corresponding pauses. (see p. 87).

Since all these exercises of learning and memorising can be carried out without the teacher, the child will without doubt use them when he is moved by interest to make use of the material. Will he study all the exercises or only part of them before applying himself to music? This is the child's own affair; he must decide.

Reading.

Later on the environment will provide him with cards — among which he can choose — on which are marked notes but not their

time value or key — merely a succession of notes on the stave. The child can proceed to his first reading of simple tunes, with the bells or on stringed instruments; and often also he will make his first attempts to sing the notes that are within the range of his childish voice.

The first reading exercises may be contemporary with the writing exercises. The child has sheets of music-paper ruled on a larger scale of stave than the ordinary, and on these sheets he can write down the notes he had found by playing tunes on the instruments.

Thus have music and the writing of music met together, without mutually interfering with each other, because they have come independently to the childs' knowledge and independently have been worked out.

C. Rhythm. Let us now pass to another element. With rhythm is connected time, the length of single notes and the bar. Here too we must start with the environment; it must afford the child music suited to carrying out his musical development. We therefore have such musical phrases or passages played to him as possess an exceptionally marked rhythm — to which the children walk on the line. They do this now without anxiety as to the exact placing of their feet; quite otherwise — no anxiety must be felt in these exercises. The child — who has now reached a special perfection in walking — can give himself up entirely to the rhythm, can completely relinquish himself to the guidance of the music.[1])

The thing to be carefully observed is that the mistress shall repeat again and again ad infinitum the same passages, so that the rhythm may reach and penetrate the very being of the child — so that he may at last perceive it spontaneously — then the player observes that one of the children is now walking in time to the rhythm of the music, he knows that another element is working itself out in the

[1]) The choice of musical passages by which to begin rhythmic exercices has great importance; and one should therefore make collections of pieces of music and try them on the children before offering them as part of the educative environment. After the first beginning made in our school by Signorina Maccheroni, two series of musical passages and pieces were collected, one by Professor Anglès and Professor Gibert at Barcellona, another at Vienna by L. Benjamin.

little walker — the sense of rhythm is born and has expressed itself in the movement of the whole body.

This is the fundamental fact. To the children who have reached this period let us then give tambourines or some such instrument for marking the time in a way that may give them pleasure — beating it on their instruments as they walk and fixing by their external manifestation the fact revealed to them from within.

When the child has become sensitive to rhythm, it is no longer necessary to go on repeating again and again the same passage; still less is it now useful to have instruments to mark the bar-accents. Such special studies are only useful during the period, soon over, during which the particular sensitiveness is in process of formation. On the contrary, it now becomes interesting to change the passages frequently to others of the same or of a different rhythm, so giving the child the possibility of excercising himself in the recognition of time, and of adapting his rhythmic movements in reponse to it.

Lastly, writing becomes an aid. In the material we have a series of cards indicating time, notes written with the exclusive aim of showing time value, without, therefore, either stave or clef. Instead we have vertical lines to mark the bar. The notes do not in this case indicate any particular *sound,* but merely the bar of four crotchets.

Four notes might suffice if we did not want to give a more complete idea as to what follows.

Finally, the fraction 4/4 can be put to express the same thing, knowing that the sign indicates 1/4 of the longest note: O (sec p. 89).

We have other tables illustrative of different rhythms to which different ways of moving correspond e.g. march, run, trot, jump. In the experiments made at Barcelona with Professor Gibert, it happened that the children, besides spontaneously interpreting, with much delicate discrimination, the different rhythms, often fell out of the march to go and write on the blackboard series of notes according to their tune values. At this period of development the studies of writing the notes according to the tune, the rests, the

value of notes in relation to these, etc. may form one of the many individual studies that the child carries out by himself.

Here we have then two different kinds of reading and writing: that of the melody or of the harmonic chord; and that of time. These two are separated one from the other. The former is represented by a succession of notes on a stave; the latter by a series of notes symbolising time value, written without stave or clef, which can finally be summed up in a fractional numeric formula. The two ways of writing as illustrated by one and the same musical phrase may be placed side by side. They represent an analysis in the study of music. In relation to the former mode of writing one can develop the ability to reproduce sounds on a musical instrument or in song; in relation to the otherthese can be developed a complete system of rhythmics and dance. (see p. 90).

Synthesis. Both harmony and rhythm, however, are in reality phases of a single thing, and when later on the child picks out a melody by ear on his instruments, he can write it down complete, that is, not only with the pitch value but also the time value of the notes. The reading of music, too, is then complete, and the obstacle at first existing has been overcome through our having separated and dealt with singly, through different exercises, difficulties of different sorts: music as melody: writing, rhythm.

The matter being, however, in reality one, we have the final recomposition of the constituent elements. Thus is called forth the interest whose sequel is progress.

D. The element separated.

If rhythm forms part of music simply and solely as the time value of various sounds, it is not only a property of music but pertains to every movement, unfolding itself in a regular and measured way along the line of time. Rhythm has been set clearly apart from harmony; our two ways of writing music stood for the visible expression of this separation.

When we read a poem, we have before us something analogous to music; a series of sounds following each other in rhythmic sequence.

In metrics we do in fact study rhythm of poetry apart from harmony of tone. Let us then read aloud pieces of poetry, choosing them as we choose our pieces of music; let us give ourselves up to the rhythmic lilt instead of to the harmony of the verse or to the meaning of the words. The child will find this easier than we shall ourselves, for he feels the rhythm of poetry long before he can fully grasp its meaning.

Let us put this to the proof by reading aloud during the lesson hexameters and octosyllabic verse in English, Italian and German.

As a result, we shall get a trotting or springing measure and various kinds of marches.

This may seem to many a somewhat freakish experiment — even a sacrilege — as applied to poetry. Yet we have in this way begun the study of metrics, letting the child *feel* what verse is before he comes to *learn* it. Analysis has thus introduced children to the study of metrics at a very early age, an age at which this exercise can still have for him an attractive and interesting aspect.

As I have said, we have here something analogous to the analysis of water into oxygen and hydrogen; these elements necessarily form part of water but can also enter into other compounds. And by first separating rhythm from harmony, we can afterwards link it up with poetry, and just as in our analytical exercises of writing, by separating one of the movements and incorpotating it in drawing we prepared the hand of the child not only for writing but for carrying out with certainty all actions requiring coördination of movement, thus rendering it docile, and capable even of obeying inspiration of an artistic kind.

Zur Psychologie der menschlichen Hand.[1])

Prof. Dr. DAVID KATZ (Rostock).

Maria Montessori hat der Ausbildung der Handgeschicklichkeit ihre besondere Beachtung geschenkt, es mögen somit in dieser Zeitschrift einige Untersuchungen zur Psychologie der menschlichen Hand am Platze sein, welche die erstaunliche Vielseitigkeit dieses Organs voll in die Erscheinung treten lassen.

Das wichtigste Tastorgan des Menschen ist seine Hand. Im Lauf einer experimentellen Arbeit, die sich über einen Zeitraum von etwa 12 Jahren erstreckt hat, wurde mir immer klarer, welches Wunder von Werkzeug in motorischer und sensorischer Hinsicht uns die Natur mit diesem Organ zur Verfügung gestellt hat [2]). Mehr als einmal hat man dem Gedanken Ausdruck gegeben, dass die Höhe der menschlichen Kultur mitbedingt sei durch die Leistungsfähigkeit der Hand, die sich bereitwillig in den Dienst des menschlichen Intellekts gestellt hat und ihrerseits dem Menschen Erfahrungen ermöglichte, die den Tieren für immer verschlossen bleiben mussten. Wie uns Beobachtungen an Kindern zeigen, wird die Hand durch den Willen erzogen, sie vergilt aber ihre Erziehung dadurch, dass sie das Kind die tiefsten praktisch verwertbaren Einblicke in die Struktur der Dinge tun lässt. Die Macht der menschlichen Hand beruht auf ihrer erstaunlichen Vielseitigkeit und Anpassungsfähigkeit, während die Organe der Tiere immer nur für einen speziellen Zweck ausgebildet sind. Der Spezialisierung des Organs entspricht beim Tier auch eine Spezialisierung des Geistigen, der Vielseitigkeit der menschlichen Hand entspricht die freie Beweglichkeit des menschlichen Intellekts. Als man sich

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[1]) Man vergleiche hierzu meinen Aufsatz „Zur Psychophysik der menschlichen Hand" in der Zeitschrift für pädagogische Psychologie 1925.

[2]) D. Katz, Der Aufbau der Tastwelt. Leipzig 1925.

während des Krieges um einen leistungsfähigen Ersatz der amputierten Hand bemühte, erkannte man bald die hervorragende Stellung dieses Universalinstruments, man sah sich genötigt auf eine getreue Nachbildung der Hand zu verzichten und sich mit Prothesen zu begnügen, die die eine oder andere Teilfunktion der Hand ausüben konnten. [1])

Wenn wir alle Tasteindrücke, die wie beim Betasten der Objekte mit der Hand erhalten, ordnend gruppieren, so ergeben sich folgende Kategorien als die wichtigsten: Oberflächentastung, raumfüllendes Tastquale, raumhaftes Tastphänomen, durchtastete Flächen. Am einfachsten ist es, wenn ich für diese verschiedenen Kategorien zur Orientierung des Lesers Beispiele anführe. Eine Oberflächentastung liegt vor, wenn ich Holz, Tuch, Leder oder dergleichen Stoffe betaste. Ein raumfüllendes Tastquale ist mir z. B. gegeben, wenn ich mit der Hand durch Wasser oder eine dickflüssige Flüssigkeit hindurchfahre. Ein raumhaftes Tasterlebnis liegt vor, wenn ich durch eine dicke Schicht von Watte oder Tuch einen charakteristisch geformten Gegenstand wie etwa einen Schlüssel ertaste. Von einer durchtasteten Fläche spreche ich beim Betasten von Gegenständen durch dünne Membrane wie etwa aus Gummi hergestellten. Von allen Tastvorstellungen, die wir von einem Stoff durch Betasten mit verschiedenen Teilen unseres Körpers empfangen haben, wird als repräsentative Tastvorstellung diejenige reproduziert, welche den grössten Reichtum an Feinheiten aufweist, und das ist die Tastvorstellung, die wir durch die empfindlichsten Tastorgane, *die Finger* erhalten. Ich habe diese Tastvorstellung in Analogie zu der Heringschen Gedächtnisfarbe als *Gedächtnistastung* bezeichnet. [2]) Die Welt als Tastvorstellung ist also ihre Vorstellung, vermittelt durch die tastende Hand.

Auch in der vorstellungsmässig beherrschten Welt ist die Hand durchaus die eigentliche Herrin. Ueberfliegt man die Einrichtungen,

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[1]) D. Katz, Zur Psychologie des Amputierten und seiner Prothese. Leipzig 1921.

[2]) Man vergleiche hierzu D. Katz, Die Erscheinungsweisen der Farben. Leipzig 1911.

die den Zweck haben, die Natur den Existenzbedingungen des Menschen anzupassen, so kommt die Vorherrschaft der Hand in gar nicht zu übersehender Weise zum Ausdruck. Alle Werkzeuge, vom plumpsten bis zum substilsten, sind für den Handgebrauch gebaut, die Bedienung fast aller Maschinen ist auf die Hand abgestellt. In einer Welt der Armlosen würde wahrscheinlich alles auf die Bedienung durch die Füsse umgestellt werden. Beschäftigen wir uns innerlich mit einem technischen Projekt, so operieren wir in Gedanken doch auch mit der Hand an den vorgestellten Körpern. Die Herrschaft des Menschen über die Welt bedeutet also eigentlich Beherrschung der wirklichen wie der vorgestellten Welt durch die Hand.

Meine Untersuchungen haben ergeben, dass man von der Hand als einem einheitlichen Tastorgan sprechen darf. Ich habe durch Versuche mit berussten Tastflächen festgestellt, dass die Lücken, welche beim Tasten zwischen den einzelnen Fingern stehen bleiben, als solche gar nicht zum Bewusstsein kommen. Sie werden taktil ausgefüllt und zwar nach Analogie zur Umgebung. Die Verbundenheit der Finger ist nicht gleich innig, der Daumen tritt mit dem Zeigefinger (meist auch mit dem Mittelfinger) in Opposition, so dass beide enger als mit den übrigen Fingern zusammengehören. Die übergeordnete Einheit ist aber die ganze Hand; sobald nur das Kind sich stärker tastend betätigt, geschieht das stets mit der Hand als einem einheitlichen Organ.

Wir besitzen in unserer Hand ein Organ, welches Dickenunterschiede von an sich dünnen, biegsamen Flächen mit einer erstaunlichen Feinheit unterscheidet. Wir bringen die Papiere zwischen Daumen und Zeigefinger, improvisieren also einen Apparat, welcher den in der Technik verwandten Schubleeren zur Dickenmessung entspricht. Bei den dünnsten Papieren werden von vielen Personen noch Dickenunterschiede von 1/100 mm. mit überraschender Sicherheit erkannt.

Bei der Erkennung von Materialien durch die tastenden Finger kommt den Temperaturempfindungen, welche die Tasteindrücke begleiten, vielfach eine grosse Bedeutung zu. Metalle verraten sich immer durch ihre ausgesprochene Kälte, während Wollstoffe

durch ihre behagliche Wärme besonders eindrucksvoll sind. Der thermische Charakter der Materialien (Wärmeleitvermögen, spezifische Wärme), der sich für die in Frage kommenden Aussentemperaturen wenig ändert, bewirkt, dass die Rangfolge ihrer Temparatureindrücke innerhalb der praktisch bedeutsamen Grenzen von der jeweils herrschenden Aussentemperatur unabhängig ist. Die Grenzen der Invarianz bestimmen sich durch die Eigentemperatur unseres Leibes. Erscheint für gewöhnlich Metall am kältesten, Wollstoff am wärmsten, so kehrt sich das Verhältnis um, wenn wir zu Temperaturen übergehen, die über Leibestemperatur liegen. Unsere Hand erweist sich hiernach als ein Thermometer von recht beträchtlicher Leistungsfähigkeit.

Wenn ich über das Material eines mir vorgelegten Gegenstandes nicht ins Reine kommen kann, beklopfe ich ihn wohl mit dem Nagelrand, und nun gibt der dabei entstehende Vibrationsimpuls dem Tastsinn die gewünschte Auskunft, auch wenn durch Verstopfung der Ohren dafür gesorgt wird, dass das Akustische bei dem Versuch ausgeschaltet ist. Ich erfahre bei einem solchen Versuch, ob ich es mit einem elastischen oder unelastischen, einem härteren oder weicheren Material zu tun habe. Es können auf diese Weise noch Stoffe von einander unterschieden werden, die bei oberflächlicher Betastung ganz denselben Eindruck machen. Bei diesen Versuchen kann die Dauer des Vibrationsimpulses bis auf die überraschend kurze Zeit von 1/300 sec. herabgehen.

Eine grosse Bedeutung haben Vibrationsempfindungen, welche durch die Hand wahrgenommen werden, im Unterricht der Taubstummen. Der Taubstummenlehrer lässt den gehörlosen Zögling die Vibrationen des Kehlkopfs eines sprechenden oder singenden Menschen mit der einen Hand fühlen, damit sie ihm als Vorbild der Lautbildung dienen, die andere Hand legt der Gehörlose an den eignen intonierenden Kehlkopf. Hat der Zögling in beiden Händen dasselbe Vibrationserlebnis, so ist ihm die Lautnachahmung gelungen. Eine taubblinde Amerikanerin (Willetta Huggins) verstand Gesprochenes nicht nur, wenn sie ihre Fingerspitzen auf den Kehlkopf, den Brustkorb oder den Kopf des Sprechenden legte, sondern selbst dann, wenn die beim Sprechen entstehenden

Schwingungen vermittels eines Billardstabes oder eines Bogens Papier auf ihre Finger übertragen wurden. Jedenfalls zeigt sich hier die menschliche Hand auch erziehbar nach einer ganz neuen Richtung.

Eine ganz überraschend grosse Reihe von Bildern der Sprache sind der Tätigkeit der tastenden Hand entlehnt worden, die Vorherrschaft der Hand wird auch hier offenbar. Wenn wir zum Ausdruck bringen wollen, dass wir uns einen Sachverhalt theoretischer oder praktischer Natur geistig angeeignet haben, sagen wir, wir haben ihn *begriffen*. Hieraus abgeleitet das Substantiv *Begriff*. Einer allgemeineren Form der geistigen Aneignung, die dem Begreifen an Sicherheit nicht nachsteht, geben wir Ausdruck durch das Verb erfassen, das doch auch auf die Tätigkeit unseres Greiforgans hinweist. Das Instrument der geistigen Aneignung, welches sich auch die Begriffe schafft, ist die *Vernunft*, ein Wort, dem man weniger als dem zugehörigen Verb *vernehmen* seine Ableitung aus der Tätigkeit der Hand ansieht. Unmittelbar an das Wort Hand knüpfen an handeln, Handel und Handlung, Bezeichnungen, die mit aller Deutlichkeit hervortreten lassen, welche Auswirkung die Tätigkeit des angeborenen Universalinstruments im praktischen Leben sprachschöpferisch gehabt hat.[1]) Die Vorherrschaft der dem Taktil-Motorischen und speziell der Tätigkeit der Hand entlehnten Sprachbilder beruht, wie ich hier nicht näher ausführen kann, auf dem Primat, den der Tastsinn in erkenntnispsychologischer Hinsicht gegenüber allen anderen Sinnen hat. Ich glaube, dass auch die auffällige und schon häufig zum Gegenstand von Untersuchungen gemachte Akkusativkonstruktion der Verben der sinnlichen Wahrnehmung durch die besonderen Verhältnisse zu erklären ist, die beim Tastsinn gegeben sind, also letzten Endes aus der Tätigkeit der tastenden Hand.

Prüft man, wie weit in den pädagogischen Systemen der Vergangenheit auch die Pflege der Sinne Berücksichtigung gefunden hat, so stellt man fest, dass der Tastsinn gegenüber den sogenannten höheren Sinnen immer recht stiefmütterlich behandelt worden ist. Die Gaben Fröbels wenden sich an den Formensinn (des Auges

[1]) Beispiele aus dem Holländischen: Plastische vertastbaring, tastbare bewijzen, aanpakken, aangrijpend.

und) der tastenden Hand, die Oberflächenartung der Holzklötze ist dabei nebensächlich. Montessori hat für den Tastsinn sehr ins einzelne gehende Uebungsvorschriften gegeben. Eine reiche Sammlung von Tastmaterialien wird dem Kind geboten, um es mit den verschiedenen Oberflächenstrukturen bekannt zu machen. Diese Tastübungen sind sehr entwicklungstreu, sie kommen der Tastleidenschaft des vorschulpflichtigen Kindes in der richtigen Weise entgegen. Die Erziehung des Tastsinns ist für fast alle Berufe von grosser Bedeutung. Wo im praktischen Leben könnte man nicht auch aus einem geschulten Tastsinn Nutzen ziehen?

In den vorstehenden Ausführungen haben wir noch gar nicht die grosse Bedeutung der Hand als *Ausdrucksorgan* berührt. Die Ausdrucksfähigkeit der Hand ist ja ganz erstaunlich, sie lässt das Temperament ihres Besitzers deutlich in die Erscheinung treten. Die Gebärdensprache der Hand hat eine gewisse Internationalität. Das äussert sich auch darin, dass man bei sehr vielen Völkern das dezimale Zahlsystem antrifft. Die in der Zehnzahl zur Verfügung stehenden Finger bildeten ja die einfachste natürliche Rechenmaschine, die man stets mit sich herumtrug. Manche Zahlbegriffe werden durch die Bezeichnung für die Hand gedeckt. In der Sprache der Küstenbewohner der Gazellenhalbinsel bedeutet lima = Hand = 5. A utal a lima = eine Dreiheit von Händen = 15.[1]) Zwei Hände oder ein halber Mensch bedeuten bei manchen Völkern 10, ein ganzer Mensch bedeutet 20 (Summe aus Fingern und Zehen). Wie sich hieraus ergibt, reicht also die Geschichte des Fingerrechnens, das jetzt noch bei jedem A-B-C-Schützen angetroffen wird, recht weit in vergangene Zeiten des Menschengeschlechts zurück. Die Hand und ihre Finger haben nicht nur zur Symbolisierung von Zahlen gedient, sondern auch in unmittelbarer Weise zur Ausführung von Messungen an Gegenständen. So spricht man von *fingerdick*, von *Handbreit*, von *Spanne* und auch in der offiziell gewordenen *Elle* ist ja die Entfernung vom Ellbogengelenk bis zur Hohlhand enthalten. Wir verstehen nach all dem, wie die Hand als treuste Dienerin des Men-

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[1]) D. Katz, Psychologie und mathematischer Unterricht, Leipzig 1913.

schen in manchem Lied besungen werden konte. Kürzlich hat ihr Gerhart Hauptmann folgende Worte gewidmet: „Die Hand ersetzt alle Instrumente, und durch ihre Uebereinstimmung mit dem Intellekt verleiht sie diesem universelle Herrschaft .... Es ist nicht zu überschätzen, was eintreten wird, wenn die Hand aus dem Stand der Verachtung in den höchsten Adelstand erhoben sein wird."

On the Psychology of the Human Hand.[1])

Prof. Dr. DAVID KATZ (Rostock).

Maria Montessori has devoted special attention to developing hand dexterity, and therefore the pages of this Journal may be a fitting place for some observations on the psychology of the human hand, which will bring out clearly the astonishing versatileness of this organ.

The hand is the most important organ of touch which man possesses. In the course of experimental work, which has extended over a period of about 12 years, it was borne in upon me how wonderful a tool in motory and sensory respects is this organ with which Nature has gifted us. [2]) More than once has the thought been expressed that the degree of human culture is determined by the capability of the hand, which is such a willing servant of the human intellect, permitting to man experiences that must ever be precluded to animals. As observations of children have shown us, the hand is trained by the will, but repays its education by allowing the child the deepest and most practical insight into the structure of things. The power of the human hand lies in its marvellous versatileness and adaptability, whereas the organs of animals are invariably developed for one purpose only. The specializing of the organ in the animal corresponds also to a specializing of the intelligence, and the versatileness of the human hand to the free movement of the human intellect. When, during the war, an efficient substitute for an amputated hand was required, the supreme importance of this

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[1]) Comp. my article "Zur Psychophysik der menschlichen Hand" in the Zeit. f. Pädagogische Psychologie, 1925.

[2]) D. Katz. Der Aufbau der Tastwelt. Leipzig 1925.

universal instrument was recognized, and it was found necessary to relinquish the idea of imitating a hand and to be content with protheses which were capable of exercising one or other partial functions of the hand.[1])

Were we to group in classes all the sensations experienced in touching objects with the hand, the following would be the chief categories: 1. Surface Sensation. 2. Sensation of space-filling. 3. space-like Sensation. 4. Sensation of penetrable surface.

The simplest way will be for me to give examples of these different categories for the reader's guidance. A surface sensation is obviously experienced if I touch wood, paper, cloth, leather or any similar substance. A space-filling sensation it is, for instance, if I draw my hand through water or a thick fluid. A space-like sensation it is if I feel some characteristically shaped object, such as a key, through a thick sheet of wadding or a cloth. And I speak of a sensation of a penetrable surface when I feel objects through a thin membrane, such as rubber. Of all sensations which we experience by touching a substance with different parts of our body, we take as the representative sensation that one which is richest in subtility, and that is the sensation which we obtain through the most delicate of the organs of touch, namely the fingers. I have named this sensation, in analogy with Hering's "memory colour", "memory sensation". [2]) Our sensations of the world around us are thus the idea of it as conveyed to us by the tactile hand.

And also in the world of our imagination the hand virtually dominates. A survey of the apparatus aimed at adapting nature to the conditions of the life of man, will convince us of the incommensurable supremacy of the hand. All our implements, from the most primitive to the most delicate, are made for manual use; almost every machine is built to be worked by hand. In a world of armless beings everything would doubtless be adapted for being worked by the feet. If we are thinking out some technical device we work

[1]) D. Katz. Zur Psychologie des Amputierten und seiner Prothese. Leipzig 1921.

[2]) D. Katz. Die Erscheinungsweisen der Farben. Leipzig 1911.

in imagination with our hands on the imagined bodies. Man's dominion over the world thus implies really his mastery of the actual as well as of the imaginary world by the hand.

My investigations have led me to speak of the hand as an organ of touch as a whole. I have established, by experimenting with the finger-tips covered with soot, that the spaces left between the fingers in touching are not consciously sensed as such. They are filled up tactually and in complete analogy with the surroundings. The affinity of all the fingers is not equally close; the thumb is in opposition to the fore-finger (generally also to the middle-finger), so that there is a closer affinity between them than between the other fingers. The supreme unit is, however, the hand as a whole; as soon as the child begins to exercise its sense of touch at all, it does so by feeling with the whole hand.

We possess in our hand an organ which can distinguish thick from thin flexible surfaces with an amazing subtility. We take a piece of paper between finger and thumb and thus improvise an apparatus which supplies the callipers employed in technics for measuring thicknesses. Many persons can discriminate with amazing accuracy differences in thickness of 1/100 m.m. between the thinnest of papers.

In the recognition of materials by touching them with the fingers the sensation of temperature which accompanies the sensation of touch is of great importance. Metals are immediately recognised by their distinct coldness, whereas woollen fabrics are specially distinct by reason of their pleasant warmth. The thermic character of materials (heat-conductivity, specific heat), which is but little affected by a certain outer temperature, causes the order of their temperature impressions to be, within practically appreciable limits, independent of the then prevailing outer temperature. The limits of this invariance are determined by our own body temperature. If, as a rule, metals seem the coldest and wool the warmest, this order is reversed if we take temperatures higher than the temperature of the body. Our hand then immediately acts as an efficient thermometer.

Should I be unable to determine the material of an object put

before me, I tap it sharply with the edge of the nail, whereupon the resulting vibrations will supply my tactile sense with the desired information, even when the ears have been stuffed so that the acoustic sense is eliminated. I can learn by such a test whether I have to do with an elastic or non-elastic, a hard or soft substance. In this way materials may be distinguished from each other which, on a superficial examination, convey the impression of being the same. In these experiments the duration of the vibration-impulse may be as short as 1/300 second.

Of immense importance are the vibration sensations received by the hand in the education of deaf-mutes. The deaf-mute teacher lets the deaf pupil feel with the one hand the larynx of a person speaking or singing, so as to furnish him with an example of sound formation; the other hand the deaf person lays on his own larynx. When the same vibration is received by both hands, the pupil has succeeded in imitating the sound. A deaf and blind American girl (Willetta Huggins) could understand what was said to her not merely by laying her finger tips on the larynx, the chest or the head of the person speaking, but also if the vibrations caused by speaking were conveyed to her fingers along a billiard cue or through a sheet of paper. In any case it is here obvious that the human hand can be trained in an entirely new direction.

A quite astonishingly large number of figures of speech are derived from the actions of the tactile hand, thus showing the dominance of this organ. If we wish to express that we have entirely mastered a certain state of affairs, whether of a practical or a theoretical nature, we say we have "got a grip of it". A commoner phrase is the expression "to grasp" a subject, or the substantive "to have a grasp" of a subject, which also indicates the action of our prehensile organ. The latter also furnishes us with the work "comprehension" to denote that part of our intellect with which we "comprehend", or "take hold" of, some idea. Other examples are: to handle a subject, meaning the mental treatment or manipulation of it; to tackle a problem; to grapple with difficulties; to cope with a situation, tangible proofs; a touching story, etc. etc., all showing the influence of this natural and universal instrument upon the phraseology

of practical life. The predominance of the metaphors derived from the motory sense of touch, and especially from the action of the hand, depends, as I need not detail further, upon the pre-eminence which the sense of touch possesses in contrast to all the other senses in respect to perception psychology. It is my belief that the accusative construction of the verbs denoting perception, which has so frequently and strikingly been taken as a subject of study, is to be explained by the special relations which are furnished by the sense of touch and thus, finally, from the activity of the touching hand.

If we inquire what consideration has been given to the culture of the sensation in the pedagogical systems of the past, we find that the sense of touch has always been too much neglected in comparison to that of the so-called higher senses. Froebel's system is directed towards the formative sense (of the eye and) of the touching hand, the surface of the wooden blocks is a secondary matter. Montessori has given us very implicit and detailed directions for exercises for the sense of touch. A large collection of material for educating the touch is provided for the child, whereby it can make itself familiar with the structures of different surfaces. These exercises in touching are extremely educative, they satisfy in the right way the desire to touch which is manifested by every young child. The education of the sense of touch is of the greatest importance in nearly all callings. Of what use cannot a highly developed sense of touch be to us in daily life!

In the preceding remarks we have not referred to the immense significance of the hand as an organ of expression. Its capabilities in this respect are absolutely astounding; it expresses clearly the temperament of its owner, and the hand gesticulations have acquired a certain international significance. This is also seen in the fact that many nations use the decimal system. Are not our ten fingers the simplest and most natural counting-machine which man has ever had?

Many a numerical term is covered by the word for hand. In the language of the coast-dwellers of the Gazelle Peninsula *lima* means *hand* = 5. *A utal a lima* = a triplet of hands = 15.[1]) Two

[1]) D. Katz, Psychologie und mathematischer Unterricht, Leipzig 1913.

hands, or a half man, indicates among many nations 10, a whole man means 20 (the sum of the fingers and toes). Likewise the history of counting on the fingers, a habit still met with in every A-B-C-infant, can be traced far back to the dim past of the human race. The hand and its fingers have not merely served as symbols for figures, but also in a direct way as a means for measuring objects. We speak of "as thick as a finger," "a hand's breadth," "a span," and likewise the official measure, an ell, indicates the distance from the elbow joint to the palm. We can understand now that the hand has been lauded as man's most faithful servant in many a verse. Recently Gerhart Hauptmann dedicated the following words to it: "The hand can fill the place of every instrument, and by its unison with the intellect, it renders the latter everywhere supreme. We cannot overestimate would will take place were the hand to be raised from its present lowly estate to a place of honour among the senses."

Sur les leçons

par

E. F. VAN DORP.

Chacun qui a eu plus ou moins de connection avec une classe montessorienne, sait que l'élément principal pour l enseignement c'est le matériel, auquel appartient une certaine technique et que la maîtresse doit offrir à l'enfant d'une manière spéciale. Cette offerte, ce soin de présenter le matériel à l'enfant est appelé généralement une „leçon". Les enfants aussi l'appellent ainsi; tels demandent une „leçon" avec le boulier-numérateur, tels autres une „leçon" sur une commande, ou une „leçon" en singulier et pluriel".

Ce n'est pas de ces leçons- à que je voudrais parler. Elles peuvent être préparées quand la maîtresse acquirait son attitude pour L'école et elle peut les apprendre à faire au moyen de beaucoup d'exercices, tandis qu'il n'y aura pas tant de différence dans la manière où elles sont données par de différentes personnes. Seulement on a besoin d'une exactitude extraordinaire, car l'esprit de l'enfant est extrêmement sensible aux moments où nous allons directement à son „ego-motore" comme Madame Montessori le nous a expliqué si nettement.

Cependant il y a encore de toutes autres leçons que nous pouvons donner dans nos écoles, souvent à toute la classe, parfois à un groupe de petits écouteurs.

Pour celles-ci il n'y a pas de matériel; les besoins de la classe montrent à la maîtresse sur quel sujet elle les donnera.

Quant à l'école des petits, Mme Montessori nous a enumeré des sujets divers pour ces leçons; nous pensons seulement déjà à toutes celles pour le travail de ménage, pour le maintien etc. Aussi dans l'école élementaire il faut encore toujours donner de telles leçons, pour fixer encore toute l'attention sur le fait comment il faut se

laver les mains par exemple il y a alors une nombre infini de sujets, parce que tout cela ensemble forme toute la vie.

Il me semble que plusieurs maîtresses ne savent que faire de ces leçons-ci; soit qu'elles ne puissent pas toujours trouver un nouveau sujet qui serait assez intéressant pour les enfants, soit qu'elles ne sachent pas au fond que tout les sujets y sont propres. Plus d'une fois on m'a demandé comment il faut faire avec les leçons et l'autre jour j'entendis dire que peut être ça viendrait à point si on voulait publier un manuel pour les leçons, afin qu'il y eût une certaine uniformité dans les écoles montessoriennes. Mais je crains vraiment qu'un tel manuel pourrait être, au lieu d'un aide un danger pour ces écoles. Car pour ainsi dire, un manuel est une chose morte plus ou moins et est ce qu'il y aurait quelque chose qui devrait être plus vivant pour l'esprit de l'enfant que ces leçons? Aussi bien pour le choix du sujet, que pour la manière dont la maîtresse les fait. Seulement le contact intime, où elle vit avec sa classe lui suggère avec une sensibilité toujours plus fine de quoi elle racontera quelque chose et c'est seulement elle qui peut faire cela avec l'expression, la vivacité, la simplicité, en somme, sur le ton juste qu'il faut pour ses élèves à elle, parce qu'elle les connaît.

Il suffit d'une comparaison sur la manière dont elle fait cette partie de sa tâche au commencement de l'année scolaire et celle qu'elle a après quelques mois.

Chaque maîtresse qui a cherché à faire tout cela avec beaucoup de soin, sait que ses leçons se subliment toujours.

Tant de fois déjà on l'a dit que dans cette méthode il dépend tant de la personalité de la maîtresse; s'il y a de la verité dans cette objection, alors c'est certainement le cas pour ces leçons. Et c'est pourquoi on ne peut pas les imiter, plus fort encore: la même personne ne pourra pas donner une même leçon plusieurs fois avec le dévouement et l'intensité de la première fois. Comment alors sera-t-il possible qu'une autre personne l'imite quand même elle eût assisté à la leçon et comment est-ce qu'on pourrait apprendre cela d'un manuel?

Je vois comme une condition très importante pour une telle leçon, pour le développement général surtout, que la maîtresse elle

même doit être touchée en vérité par le sujet. Peut-être pas justement hier ou aujourd'hui, au moment où elle la donne aux enfants, mais il faut qu'un certain jour le sujet ait frappé aussi son „égo-motore" à elle. En effet: seulement l'expérience peut l'aider; quand elle continue à observer les élèves avec une attention toujours veillante elle verra aux enfants si la leçon a réussi ou non.

Une fois j'ai éprouvé un exemple que je pourrais raconter. Pendant les vacances je faisais une grande promenade, en compagnie de quelques autres. Nous rencontrâmes un garde-forestier, qui nous racontait des choses intéressantes sur l'éclaircissage, l'entretien des bois de sapins. C'était fort intéressant et pendant plusieurs jours mon attention restait fixée sur l'existance de nos bois.

Plus tard dans l'école, les enfant m'apportaient des pommes et des aiguilles de pin et je me souvins de ce que j'avais appris.

Le jour suivant je donnais une „leçon" parlant d'un petit bois de sapins pas loin de notre école. A ce moment il y avait dans ma classe plusieurs enfants qui se trouvaient dans la période suivant immédiatement à celle òu ils avaient appris à lire et à écrire, et où ils n'ont jamais assez de choses pour copier et pour lire à haute voix.

Cet après midi, cette leçon donnée, trois petits garçons venaient me demander si je ne voulais pas faire pour eux un petit livre qui devrait contenir ce que j'avais raconté. Je le promis et au soir de la même journée je l'écrivis:

„Près de notre école il y a un beau bois de sapin. Parfois nous y allons pour faire le silence. Le bois est encore jeune et doit être éclairci encore. C'est ce qu'on fait au mois de janvier.

Les arbres faibles, courbés ou inclinés sont abattus.

Ces arbres sont entassés plus tard en petits groupes. Un tel tas d'arbres est appelé une parcelle.

Les parcelles de bois sont vendues pour êtres brûlées.

Les paysans employent aussi les troncs pour des piquets dans la culture des fèves.

De petits brins en restent sur la terre, quand les parcelles ont été emmenées. On peut s'en servir encore. Des femmes et des enfants vont les ramasser.

Autrefois le mois de février s'appelait le mois des ramasseurs (nom hollandais employé encore au siècle dernier)".

C'est proprement avec avidité que la classe s'est emparée de ce petit livre. Je veux raconter quelques-unes des réactions.

Durant 17 jours plusieurs enfants l'ont lu à haute voix pour les autres avant où après la leçon de silence, de sorte qu'un tout petit qui ne sait pas encore lire le connaissait déjà par coeur. Je ne sais pas combien de fois ils l'ont copié, et ils le font encore.

Le quatrième jour après que je l'avais fait j'allais faire une promenade avec tous ceux qui prennent leur déjeuner à l'école, et nous devions passer par ce bois de pins.

Mais le petit François de ma classe à moi ne voulait pas continuer si nous n'avions pas fait le silence. Aux enfants plus grands qui ne connaissaient pas cette leçon de silence il l'expliquait. Mais le temps fut pluvieux et je disais que la terre fut trop humide pour nous asseoir. „Alors restons debout," il me supplie et c'est ainsi que nous faisons le silence. Quand il a fini et que nous continuons la promenade, François dit: „Voyez vous, c'est ce qu'il y a dans notre livre à nous de notre bois à nous et alors il le faut faire, n'est ce pas?"

Une semaine après deux autres petits garçons me demandent: „Mademoiselle, il y a dans le livre du bois à pins que le mois de février fut appelé autrefois le mois des ramasseurs, mais voulez-vous bien nous enseigner aussi les anciens noms des autres mois?"

Trois semaines s'en vont; Fanny (6 ans) met avec les petites lettres séparées sa première composition sur la table: „Ma mère „a sa fête au mois des ramasseurs, nous avons un petit livre où „l'on peut lire du ramassage dans le bois des pins et les mois ont „aussi un nom hollandais. Et j'aime beaucoup le mois des ramas- „seurs. Parcer qute alors Maman a sa fête. Je lui donne le petit tapis, „que j'ai fait à l'école."

Maintenant que la leçon et le livre sur le bois de sapins n'est plus au foyer de l'attention des enfants, ils viennent pourtant le lundi me raconter certaines choses qu'ils ont remarquées en se promenant le dimanche.

C'est facile à comprendre que plusieurs personnes, surtout celles de l'enseignement, penseront en lisant ceci aux „leçons de choses" à l'école comme si bien connues.

On dit que cette sorte d'enseignement va disparaître et il y aura beaucoup de causes pour cette disparation. Nous lisons dans les livres de Mme Montessori aussi de certaines exemples de leçons de ce genre et on voit clairement que le seul travail pour les enfants y est d'écouter et encore écouter. L'instituteur parle beaucoup trop, on cherche d'y entraîner mille choses qui ne sont en aucun rapport avec le sujet de la leçon et qui donnent plutôt le désordre au lieu de l'ordre dans les pensées de l'écolier.

Et aussi plus tard, lorsque *l'auto-activité* est entrée dans les écoles qui est appliquée avant tout dans ces leçons de choses, l'espoir d'une amélioration a été trop grande. Excepté maintenant les fautes du système classical, je crois q'une grande cause pour cet échec se trouve aussi dans le fait que les maîtres qui donnaient une telle leçon, devaient chercher toute leur préparation dans un manuel.

Naturellement c'est fort intéressant de *savoir* comment on fait du fromage; mais on l'apprend seulement dans la ferme elle-même. Et c'est autre chose que dans un livre. Une fois que je demandai quelque curiosité sur le fabricage du fromage à une institutrice qui donnait ces leçons depuis des années, elle me répondit: Ah, c'est ce que moi je relis toujours moi même avant de le raconter à la classe". Il ne faut pas lui en vouloir. Mais pourtant c'était là la cause qui empêchait sa leçon d'être une bonne leçon. Parceque avec tout ce „relire" la maîtresse perd en quelque façon son expression spontanée et sans cela déjà la leçon en vaut moins.

On pourrait demander: alors la maîtresse dans l'école Montessori ne doit jamais se préparer ? Si, elle le doit, mais je voudrais l'expliquer ainsi: sa préparation doit être indirecte, c'est à dire: il ne faut pas penser la veille, quelle leçon pourrais-je donner demain ? et alors se preparer. Je ne crois pas que ça serait la bonne manière. L'expérience nous apprend que seulement une ou deux fois on arrive en effet le lendemain à donner cette leçon préparée. La raison est simple: la *curve* d'un certain jour n'est presque jamais identique à celle du jour précédent ou suivant et le besoin d'une „leçon" se

montrera aujourd'hui au commencement, demain à la fin et après demain peut-être pas du tout.

L'élément important me semble que la maîtresse soit une personne qui a tant d'interêt pour toutes les choses de la vie qu'elle se prépare ainsi involontairement toujours, ayant les sens ouverts, afin que, la classe montrant le besoin d'une leçon, elle soit prête à la donner. Les paroles avec lesquelles nous sommes devenues peu à peu familiers: „Observer et attendre" ne seraient alors plus seulement appliquées a notre classe.

N'est ce pas, nous n'enseignons pas une chose à l'enfant parceque nous voulons enseigner, mais parceque nous répondons à sa demande de lui aider dans sa croissance et cette demande peut germer dans l'individu, mais aussi dans un groupe d'enfants.

Cependant nous ne pouvons pas être assez exacts avec ces leçons. La maîtresse doit les donner avec la même exactitude que pour les offertes du matériel. Quelquefois comme par hasard nous nous apercevons de cette importance. Une fois j'avais emmené de petits verres pour y mettre les crayons, un pour chaque couleur. Je les offris à la classe avec une leçon montrant comment il fallait manoeuvrer avec ces crayons dans les verres. Pendant toute l'année il en est cassé deux, c.a.d. par les deux enfants qui furent malades ce jour et qui n'avaient pas assisté à la leçon. Cela me semble naturel comme aussi ce que je vois maintenant dans ma classe: les trois enfants qui ont eu les premières leçons de la commande sur l'adjectif: remplis deux verres avec de l'eau, une toute pleine, l'autre pas toute pleine etc. sont aussi les seuls enfants qui en exécutant cette commande sont les seuls á ne pas verser une goutte d'eau, tandis que les autres ne sont pas si habiles. On y voit que je ne sais pas encore répéter une leçon plus de trois fois avec la même attention moi même.

Il arrive parfois dans une classe qui a déjà un certain ordre qu'un enfant veut continuer une leçon donnée par la maîtresse. La semaine passée j'avais parlé des oiseaux voyageurs qui retournent vers le printemps au pays où ils demeurent pendant l'été; des hirondelles, entre autres, et en ce rapport j'avais parlé du proverbe qui dit: une seule hirondelle ne fait pas encore le printemps. Quelques jours après un petit (6½ ans) disait en entrant dans la classe: Made-

moiselle, je voudrais au commencement du silence continuer votre leçon de jadis." Et depuis qu'on fait le silence il raconte: „ce matin, quittant la maison je ne vis pas une seule hirondelle mais une quantité. Elles volaient ensemble et les plus grandes indiquaient le chemin, je le voyais clairement. J'espère qu'elles ne seront pas venues trop tôt, mais heureusement le soleil luit déjà et aujourd'hui il fait plus chaud. En allant à l'école, je pensais: une seule hirondelle ne peut pas faire le printemps, c'est vrai, mais beaucoup d'hirondelles le feront bien." Gonny disait encore: „C'était un récit délicieux, Halbe," et alors le silence commença.

Le 22 janvier Beppie ($7^1/_2$ ans) dit: „je sais une leçon, mademoiselle, je l'ai écrite et je la raconterai aux enfants." Voilà ce qu'elle lisait:

Feuille.

Cette feuille est verte.

Mais les feuilles fânées sont d'un brun clair.

Et quand elles se fânaient, elles allaient loin, loin sur la terre.

Et alors elles s'envolent.

Maman va au bois et Maman dit: „Jean, les feuilles vont jouer aux barres. Maintenant il nous faut rentrer."

Il y a toujours pour une telle leçon d'un enfant une attention spéciale, presque dévouée. La réaction de cette attention me fut claire le 16 Mars dans l'après midi, lorsque plusieurs enfants dessinaient devant les fenêtres ouvertes; le vent commençait à souffler plus fort; alors une petite voix disait: „A présent quand j'entends aussi les feuilles mortes glisser sur le sable, je pense toujours à cette belle histoire que Beppie nous a donnée." Et tout le monde fut d'accord.

Il me reste encore une chose à remarquer sur les leçons: On parle beaucoup de la collaboration de la maison et de l'école, on cherche la route mais souvent on ne l'a pas encore trouvée. Les parents sentent que la chose n'est pas finie en donnant seulement de petits meubles aux enfants; il ne peuvent pas avoir tout le matériel Montessori à la maison et ce n'est pas du tout l'intention de „l'éducation Montessori chez soi." Mais je crois qu'on pourrait trouver la base de la collaboration avec ces „leçons". Car ce que j'ai voulu montrer c'est que ces leçons ne sont pas exclusivement quelque

chose qui intéresse maîtresses, mais en premier lieu les éducateurs, et tous les adultes. Il me semble souvent que toutes les plaintes des parents des enfants qui n'obéissent pas quand on les appelle pour le dîner etc., ne seraient pas nécessaires, qu'on devrait chercher d'éviter tout cela. Est ce que les parents ne pourraient pas faire comme font les maîtresses et chercher la difficulté d'une chose pour celui qui ne sait pas la faire? Et alors donner les leçons. Ce sera une grande joie et un bienfait pour les enfants si vraiment le monde les recevait comme de petits étrangers auquels on indique avec plaisir le chemin dans cette vie ravissante où ils doivent se sentir „chez eux."

Les leçons sont un aide et une joie pour les petits.

Un petit garçon voyant que je voulais commencer une lecon se hâtait à mettre en ordre les . . . sur sa table et avant de s'asseoir il battit des mains en disant aux autres: „Mettez en ordre bien vite! Mademoiselle veut faire de ces choses amusantes que nous ne faisons jamais chez-nous!"

Parents, faites les y venir bien vite!

The new Mistress

by

Dr. MARIA MONTESSORI.

It is in the existence of psychic stimuli, calling into activity the intelligence of the child, that our Method finds its justification; and yet it would be wrong to attribute to them an effect that is all-sufficing.

It is, therefore, on the mistress that a great part of the effect of these stimuli depends; it is by her way of presenting the objects to the child that she will render them completely effective as stimuli. If, then, she finds within her reach a means of rendering them effective, of making them serve their whole use, her way of presenting them assumes as great an importance as that possessed by the objects themselves. This special way followed by the mistress in presenting the material may be termed her *Lessons*.

Students of my system are often much concerned about these *Lessons given by the mistress*. It should, therefore, be interesting to study side by side the way lessons are given in my system as compared with that used in ordinary schools. In our lessons the chief thing is to call forth auto-education. Once the child has become intelligently active, it is by repeating the exercises that he will perfect himself. The work he is thus doing is his very own; the mistress is an outsider, whose only business has been to present the stimulus.

In dealing with tiny children, not culture, but the development of intellectual activity, is our chief aim.

The lessons given by the mistress will be innumerable; for it is clear that the child cannot by himself guess at the use of the objects before him; clearly it is the mistress who must teach him

how to use them. Many mistresses enquire of me: "If we present the material gracefully, politely and kindly, is that all that is required of us?" It is far from being enough. The important matter here is the way in which the material is to be used. Let us take for example the knife, fork, etc. used in laying a place at table. We, Europeans, all know the use to which these objects are put; but suppose an Indian who sees them on the table for the first time; he will be fairly puzzled until he has seen them used by one of us.

Just so, when the teacher builds up the set of pink cubes into a kind of tapering tower, knocking it down as soon as made; when she takes out the cylinders from their holes in the block, mixes and replaces them; when she unrolls a carpet on the ground, etc. These are actually lessons that she has given. They are lessons without words, it is true; and this may seem strange to those of us who by *lesson* understand a discourse by the teacher. The teaching a child to sit down, get up, carry a table, or a tray with glasses; the teaching it in short to carry out movements, all these are lessons. Keeping silence, too, is one. We teach the child to keep quiet, his whole attention bent on staying motionless and silent till he is called by a voice breathing his name.

We may say, then, that this silence is a lesson symbolising all our teaching. We teach everything in this way: even things that it would seem impossible to impart without words. In all the things that surround him, the child has a teacher; well, the mistress is one who, by setting him in direct relations with his surroundings, can teach him all things.

Other methods do not teach him all things. They employ commands. The mistress says to the child "Hush!" or "Walk straight!" And these commands are held to be educative. For us, it is not by words or by commands that we teach, but by a patient, mysterious guiding of activity; and to our guidance the child responds by perfecting his aptitudes through the frequent repetition of the exercises.

The commands given by other schoolmistresses remind us of the Creator in Genesis, who said: "Let there be light!" (and there was light). "Let the earth be divided from the waters!" (and

it was so). But the possibility of obedience to these commands implies a formation previously achieved; the child must already possess an ability before he is capable of responding to a command. So it would seem that it is not a command which one should give to the unformed child; it is rather a formative exercise that we have to evoke.

How often one hears a piano-teacher say to her pupil: "Place this finger!" without telling him how; and he places it wrongly. Thus it continues: one always protesting, the other always placing it the wrong way, to the end of the chapter.

Previous to the spoken word we must have something more essential: we must have formation. It is only exercise that can *form,* and for that, words are not needed. Existence is the first thing: one must *be,* before one can *know.*

Not that words, too, cannot be taught. Then we have lessons in vocabulary and elocution.

Inexperienced teachers generally attribute immense importance *to lessons,* imagining that their own preparation ends when they have presented the material in the right way. The truth is far otherwise; the mission of the mistress is much more important than this. She has to direct the development of the child's soul. The limited role of a simple observer of children is quite different. Such a one does not aim at *knowing* the children, but simply at *helping* them.

It is, then, useful to know certain fundamental principles capable of aiding this work of direction. The chief thing here is to be able to recognise those states of polarisation of the attention which we have called *Concentration.* When the child is wrapped up in attention to his great work, the mistress must respect this attention; she must not interfere with either correction or encouragement. It is then that she must absolutely observe the principle of non-intervention. Certain teachers have absorbed this principle offhand, *en passant* as it were; they have told themselves that all they have to do is to distribute the material, then withdraw and be silent whatever happens.

Result: frightful disorder in the school! But non-intervention — the sign, that is, of respect for the child's activity — is only appro-

priate when some interesting phenomenon is taking place in the child's life; it is out of place when disorder reigns and the attention of the child is all astray.

I have seen in a school disorderly children who took all sorts of material and used it in an absolutely wrong way. Among them glided, sphinx-like, the mistress, without words. I suggested: "Wouldn't it be better for the children if you went for a stroll in the garden?" Whereat she started, going from child to child, speaking softly in the ear of each. "What are you doing? I asked her; and she replied: "I don't want to disturb them; so I whisper."

Her mistake lay in fearing to disturb disorder! If she had feared upsetting order she would have been in the right.

A mistress once said to me: "You would have us respect the child's concentration as a very superior thing, comparable to the inspiration of an artist or of a man of science? Why, then, do you tell us we can interfere when the children play with the Didactic Material?" "It is quite true," I replied "that I respect the normal inner activity of the child as much as I do the inspiration of an artist, but it is the inspiration and not the artist which calls forth my respect. If I dropped in on the artist and found him sitting at home smoking and playing cards, I should not be afraid of trespassing, nor should I scruple to call to him, saying: "My dear friend, why sit wool gathering here? Come out for a stroll in the sunshine?"

Our method does not insist upon respect for the futile or the erroneous!

As a fundamental thing, therefore, in her knowledge of the method, the mistress must learn to distinguish between good and evil. By Good, we mean here the psychological states favourable to the child's development, to his health of mind. By Evil, we mean the psychological states void of formative influence or actually unfavourable to his development, since they lead merely to useless scattering of his forces.

Not only to mistresses do we recommend this fundamental knowledge, but above all to mothers.

Without any doubt the mistress might well admonish the child somewhat briskly in order to get him out of this state of disorder.

But a capable teacher possesses other and more efficacious means than force; although these means require sustained attention and persevering effort. One of the principles to be observed will be the minute supervision of the environment in which the child moves; which will become a veritable work of foresight and love.

As a wife supervises the arrangement of her husband's house, so as to make it pleasant and attractive to him, so must the mistress busy herself about the child's surroundings. Constant attention is needed, and even this is not enough; she must know all the child's needs. More still, she will work with her own hands to embellish the cradle of the new-born soul.

In addition to the perfect presentation of the material, in addition to this fundamental psychological knowledge of the child, she must take the most minute care of the smallest details in the environment, keeping a continual watch over the objects it contains.

By the habit of observation the mistress will arrive at understanding little by little, but clearly, what her mission is.

On this observation of minute details depend the order, or the disorder, of the children; on it depends the results she will obtain in her school. It is, therefore, essential that she should train herself if she wishes to arrive at the right observation of these details.

It would be easy to give an example of the serious consequences derived from errors apparently trifling. Let us suppose a house of workmen in which baths have been added. If the tenants use these baths to store coals in, they can obviously not wash in them any longer. Not only will this be bad for the house, but the error, trifling, if you will, in itself, will result in a state of inferiority; they will not be able to take advantage of the gifts of civilisation placed within their reach. Thus one will obtain very small results instead of the great ones that were expected; disorder instead of order. The ability of the mistress in our Method depends on the enlightened application of principles which inspire her to strive against little obstacles and thereby achieve great results.

Analogous to the Way of spiritual perfection is the path she has to follow. It is not that the trifling venal sin overcome leads

straight to perfection. It is rather that the soul, freed from these trifles, is capable of rising. The overcoming of the trifles has brought into play all the energies of life; by the overcoming of the little difficulty an obstacle is removed from the path to perfect order. It is not the child in himself that we take into consideration, it is the error that we have to track down. Our work is the dealing, not with the sinner, but with the sin.

Ordnung und Reihenbildung.

von

GÉZA RÉVÉSZ.

1.

Legen wir Kindern einer Montessori-Vorbereitungsschule eine Reihe *Farben von verschiedener Qualität* vor und fordern wir sie auf, die Farben aneinander zu reihen, so werden die meisten von ihnen, die dargebotenen Farben nach dem Grad ihrer Aehnlichkeit zu einer Reihe bilden. Sie werden zunächst eine lebhaftere Farbe aussuchen, um die übrigen diesen an zu reihen. Der Auftrag wird sowohl von grösseren wie auch von kleineren Kindern richtig ausgeführt, da sie sich schon in der Schule geübt hatten, *Schattierungen verschiedener Farben* stufenweise zu ordnen.

Man macht die Erfahrung, dass manche dieser Kinder stutzig werden, wenn man sie auffordert, aus *verschiedenen* Farben eine Reihe zu bilden, vermutlich darum, weil sie in der Schule bloss dazu Gelegenheit hatten, Schattierungen *desselben Farbentons* zu ordnen. Sobald aber die Ueberraschung sich legt, führen sie unseren Auftrag meistens ohne Fehler aus. Die Sicherheit bei der Reihenbildung hängt freilich von der Anzahl der dargebotenen Farben, und von dem Grad der Aehnlichkeit der Glieder ab. Auch Kinder einer Fröbelschule werden unsere Aufgabe lösen können, wenn man ihnen zunächst klar macht, was man eigentlich von ihnen will. Es ist zweckmässig mit ihnen zuerst Vorversuche anzustellen, z.B. Holzklötze verschiedener Grösse ordnen zu lassen, um sie dadurch auf die Reihenbildung aufmerksam zu machen.

Die Farben, die man bei diesem Versuche den Kindern vorlegt, sind stets *Mischfarben*, z.B. *rot* mit gelblichem und bläulichem, *gelb* mit rötlichem und grünlichem, *grün* mit gelblichem und bläu-

lichem, und *blau* mit grünlichem und rötlichem (violettem) Einschlag. Dadurch erreichen wir, dass das Kind, — unabhängig davon, mit welcher Farbe es auch die Reihe anfängt, — zu jeder Farbe leicht eine solche findet, die dem Aussehen nach der vorgelegten Farbe ähnlich ist. Fängt das Kind z.B. die Reihe mit einem orangefarbigen Klotz an, so wird es daneben entweder einen gelben oder einen rotem legen, wählt es als Anfangsglied der Reihe etwa eine grünlich-gelbe Nuance, so wird sich ihm als nächstfolgendes Glied entweder ein Gelb oder ein Grün aufdrängen. Fallen ihm beim Suchen mehrere ähnliche Farben auf, z. B. neben einem Rot *ein mehr* und *ein weniger* rötliches Gelb, so wird das Kind dem Rot jene Farbe zuordnen, in welcher das Rot stärker vertreten ist. Mit einem Wort: bei der Reihenbildung der Farben, wenn neben reinen Farben auch Mischfarben vorhanden sind, wird das Kind, wie auch wir, *durch die unmittelbare Ahnlichkeit der Farbentöne* geleitet.

2.

Ganz ähnliches nehmen wir wahr, wenn wir Kinder veranlassen, Längen, Grössen, Gewichte zu ordnen. Schüler einer Montessori-Klasse werden diese Aufgaben ohne Weiteres lösen, da sie mit derartigen Aufgaben schon vertraut sind, während andere Kinder erst dazu vorbereitet werden müssen. Die Lösung der letzteren Aufgaben ist noch leichter, als die mit verschiedenen Farbentönen, da hier *nicht nur die Stelle eines jeden Gliedes innerhalb der Reihe,* sondern auch das *Anfangsglied, bezw. Endglied der Reihe eindeutig bestimmt ist.* Biete ich z. B. 3 verschiedene Gewichte oder 3 verschiedene Längen dar, so können bloss das schwerste und das leichteste Gewicht, bezw. die grösste und die kleinste Länge *als Randglieder* (Anfangs und Endglied) in Betracht kommen, und kann nur *eine* von den drei, die *mittlere Stelle* in der Reihe einnehmen. Nicht anders steht es bei Darbietung von mehreren Gliedern, vorausgesetzt, dass die Unterschiede deutlich wahrzunehmen sind. Diese vollkommene Bestimmtheit der Reihenfolge ist der Grund, warum Montessori bei Uebung der Sinne bloss solches Material verwendet, wo die

Glieder bloss in *einer Weise* geordnet werden können. Stäbe in verschiedenen Längen, Holzklötze in verschiedenen Grössen, Körper in verschiedener Dicke, Täfelchen in verschiedener Schattierungen, dienen diesem Zwecke. Auch beim Tonmaterial lassen sich dieselbe Bedingungen herstellen. Montessori hat einen Satz Glockentöne herstellen lassen, welche den diatonischen und chromatischen Tonleiter darstellen. Nach einer gewissen Uebung sind die Kinder im Stande die Töne in der natürlichen Reihenfolge zu ordnen.

Zwischen der von mir gestellten Aufgabe, — verschiedene Farbentöne in eine Reihe zu bringen, — und zwischen den Aufgaben, die Montessori für die Sinnesübung vorschlägt, besteht prinzipiell *kein* Unterschied. Es handelt sich in beiden Fällen um *zweidimensionale Mannigfaltigkeiten,* wo die Stelle eines jeden Gliedes in der Reihe eindeutig bestimmt ist. Der Unterschied liegt nur darin, dass während bei Gewichten, Längen, Farbennuancen, Tönen auch die Randglieder, d. h. die Anfangs- und Endglieder der Reihe bestimmt sind, ist bei der Reihenbildung mit Farbentönen freigegeben, von welcher Farbe man ausgehen, welches Glied man als Randglied betrachten will. Dass die Kinder bei dieser Aufgabe *gewisse Farben* vorziehen, folglich die Reihe meistens mit einer *bestimmten Farbe* zu beginnen pflegen, ändert an der prinzipiellen *Wahlfreiheit in bezug auf das Anfangsglied* nichts. Bloss in einem Falle sind die Randglieder auch bei unserer Aufgabe fest bestimmt, nämlich dann, wenn die dargebotenen Mischfarben nicht aus dam ganzen Gebiet der Farbenqualitäten entnommen sind, sondern bloss zu einem *beschränkten Teil der Farbenreihe* gehören. Bieten wir z. B. Farbentöne aus dem Gebiet gelb über grün und blau bis Violett dar, so sind wir gezwungen mit gelb oder mit violett die Reihe anzufangen, denn jede andere Ausgangsfarbe würde dazu führen, gelb und violett nebeneinander zu setzen, was wegen des dadurch entstehenden Kontrastes meistens vermieden wird.

3.

Man kann die Verhältnisse dadurch komplizieren, indem man solche Reizobjekte herstellt, wo nicht bloss — wie bisher — *eine* Eigen-

schaft, sondern *deren zwei* sich ändern. So kann zum Beispiel neben dem Farbenton auch noch die Helligkeit oder die Grösse der zur Wahl vorgelegten farbigen Flächen variieren. In diesem Falle haben wir mit einer *dreidimensionalen Mannigfaltigkeit* zu tun. Aus dem Umstand aber, dass die Verhältnisse hier *objektiv* komplizierter sind, lässt sich noch nicht schliessen, dass damit auch die Lösung der Aufgabe, nämlich die Glieder in eine geordnete Reihe zu bringen, schwerer sein wird. Aendern sich nämlich zwei Eigenschaften, wie z. B. Farbenton und Flächengrösse *in gleicher Richtung,* geht also mit der Aenderung des einen Merkmals die der anderen parallel, dann wird die Reihenbildung sogar noch *erleichtert.*

Man mache einen Versuch in der folgenden Weise: Man schneide aus 5 verschieden hellen Karton (vom Schwarz über 3 Grautöne nach Weiss) quadratförmige Flächen von verschiedener Grösse in der Weise aus, dass mit zunehmender Helligkeit auch die Flächengrösse zunehme. Beispielsweise soll die schwarze Fläche die kleinste, die weisse die grösste sein, während die grauen Flächen sich der Grösse nach zwischen beiden ordnen mögen. Bieten wir nun diese Flächen Kindern dar, so werden sie die Glieder ohne weitere Erklärung zu einer sinnvoll geordneten Reihe bilden. Die in gleicher Richtung sich ändernden Merkmale der Flächenreize werden die einzig mögliche Reihenbildung noch erleichtern. Stellen wir jedoch die Reize so her, dass die Aenderung beider Merkmale voneinander unabhängig, also nicht parallel verläuft, dann ist es möglich, dass die Reihenbildung wegen der miteinander in Konkurrenz tretenden Faktoren erschwert wird. Zum Demonstrationszwecke schneide man 5 quadratförmige, verschieden helle Papiere aus, etwa in folgender Weise: ein 2 cM^2. schwarzes, ein 3 cM^2. mittelgraues, ein 4 cM^2. weisses, ein 5 cM^2. dunkelgraues und schliesslich ein 6 cM^2. hellgraues Quadrat.

Falls die Helligkeits- und Grössendifferenzen deutlich wahrnehmbar sind, so wird sich das Kind bloss entscheiden müssen, ob es sich nach Helligkeits- *oder* nach Grössenabstufung richten will. Eine wirkliche Entscheidung bleibt aus, wenn das Kind einer *natürlichen Tendenz* zufolge sich sofort auf eines der Merkmale

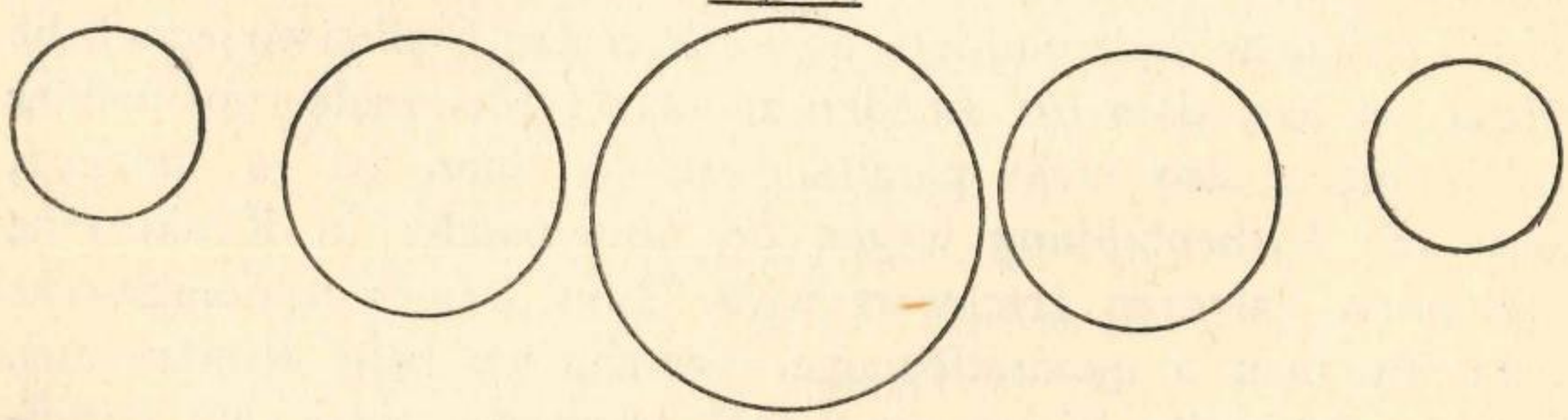
einstellt. So wird z.B. ein Farbenwähler die *Helligkeitsdifferenzen* beachten, (die Grössendifferenzen infolgedessen vernachlässigen,) während ein Formwähler sich durch die *Grössenunterschiede* leiten lassen wird.

4.

Aehnlich gestalten sich die Verhältnisse auch dann, wenn bei der Reihenbildung Ordnungsprinzipien besonders heterogener Art zur Geltung kommen. Das ist der Fall, wenn z.B. das Aehnlichkeitsmotiv zusammen mit einem Motiv anderer Art auftritt. Ueber einen derartigen Versuch berichtet Dr. *I. Hermann* in einer seinen kinderpsychologischen Arbeiten, wozu die Beiträge meine Schüler geliefert haben. Es handelte sich hier darum, die Rolle der Symmetrie bei der Reihenbildung zu studieren.

Man bot Kindern von 3 bis 10 Jahren 5 Kreise dar, und zwar zwei von 3 cM., zwei von 5 cM., und einen von 7 cM. Durchmesser. Die Kinder wurden aufgefordert, die 5 Kreisflächen "in eine Reihe zu bringen, so, wie sie am besten zueinander passen," oder so, dass sie "eine richtige Reihe bilden sollen".

FIG. 1



Infolge der beiden Ordnungsprinzipien können die Kreise entweder *nach Grösse*: 1, 1, 2, 2, 3,
nach Symmetrie: 2, 1, 3, 1, 2,
oder *nach Grösse und Symmetrie*: 1, 2, 3, 2, 1,
aneinander gereiht werden.

Es hat sich nun bald herausgestellt, dass die Kinder schon vom 3. Jahre grundsätzlich fähig sind bei Anordnung der Kreise *beide*

Prinzipien anzuwenden. In der Mehrzahl der Fälle wird die Reihenfolge allerdings bloss durch die Grössenabstufungen bestimmt, eine symmetrischen Anordnung im Anschluss an die Grössenanordnung wird aber auch schon sehr früh beobachtet.

Die Häufigkeit, mit der die eine oder die beiden Ordnungsprinzipien angewendet werden, hängt vom Alter ab. Mit 3 bis 8 Jahren ist die Reihenfolge nach der Grösse vorherrschend, während mit vollendetem 8 Jahre macht sich der Einfluss der Symmetrie immer mehr geltend.

Tabelle I.

Anzahl der untersuchten Kinder: 107.

Ordnungsprincip	Alter		
	3—6 [1])	6—8	8—10
Grösse	69 %	68 %	50 %
Grösse und Symmetrie	22 %	20 %	41 %
Symmetrie	—	4 %	6 %
Ohne jede Ordnung	9 %	8 %	3 %

[1]) Falls die zu dieser Alterstufe gehörenden Kinder nicht im Stande waren spontan eine Reihe zu bilden, so wurden sie dazu angeregt. Wie Verfasser er-

Bei Darbietung dieser 5 Figuren ist die Reihenfolge von vornherein nicht eindeutig bestimmt; es gibt drei Lösungen, die alle richtig sind, mag man auch die Ordnung nach Grösse *und* Symmetrie über die beiden anderen Möglichkeiten stellen. Der Aehnlichkeitsfaktor war vorherrschend (67 %), da es die Gleichheit und Aehnlichkeit der Kreise ist, die sich dem Kinde vor allem *aufdrängt,* und die es in seiner Wahl nahezu ausschliesslich beeinflusst. Mit zunehmendem Alter kommt das Prinzip der Symmetrie immer mehr zur Geltung. Bei der Reihenbildung scheint das letzetere Prinzip nur dann eine besondere Rolle spielen zu können, — wenigstens bei Kindern —, wenn ausser ihm *keine* andere Ordnungstendenz (wie etwa Ordnung nach Grösse, nach Farbenähnlichkeit) ihre Wirkung auszuüben vermag, oder wenn die beiden Principien zusammen wirken können (1, 2, 3, 2, 1). Auch in dem vorliegenden Falle konnte die Symmetrie als Ordnungsprinzip bloss darum so deutlich zur Geltung kommen, weil seine Berücksichtingung dem Aehnlichkeitsprinzip nicht, widersprach. Mit dieser Auffassung stimmt überein, dass die Symmetrie ohne Mitwirkung des Aehnlichkeitsprinzips bloss ausnahmsweise (im Ganzen in 4% der Fälle) in Erscheinung trat. Wie sich diese beiden Prinzipien bei der Reihenbildung verhalten würden, falls sie miteinander in *Konkurrenz treten,* falls die Reihe *entweder* auf Grund der Aehnlichkeit (Grösse, Farbenton, etc.) *oder* auf Grund der Symmetrie gebildet werden kann, wird z.Z. in meinem Laboratorium von *Frl. M. Bos* untersucht. —

Die beiden Ordnungsprinzipien, die in den letzten Versuchen zur Geltung kamen, sind, — wie wir gesehen haben, — vom entwicklungsgeschichtlichen Standpunkte aus, verschieden zu beurteilen. Die Tendenz, die die Kinder bei der Ordnung nach Grössen leitet,

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wähnt, legten die Versuchsleiter öfters die beiden kleinsten Kreise in einem gewissen Abstand voneinander hin, und forderten die Kinder auf, die übrigen denen anzureihen. Es ist anzunehmen, dass diese Hilfe vielfach zu der Reihenfolge: 1, 2, 3, 2, 1, führen musste. Dadurch lässt sich der etwas grössere Prozentsatz bei den 3—6 jährigen Kindern gegenüber dem etwas kleineren bei den 6—8 jährigen erklären. Hätte man diese Hilfe nicht angewendet, so wäre die Zahl der misslungenen Fälle, wie auch die der bloss nach Grössenordnung hergestellten Reihen bei den jüngeren Kindern grösser ausgefallen.

ist ursprünglicher, primitiver, als die, die sie zur symmetrischen Anordnung führt. Damit erklärt sich, warum jüngere Kinder öfters durch die Grössenordnung bestimmt werden, als ältere.

Die Wirkung zweier heterogener Motive lässt sich auch im Gebiete der *Farbenwahrnehmungen* studieren. Hier wird sich aber im Gegensatz zu dem obigen Versuch zeigen, dass die beiden Motive *nicht zussammenwirken* können. Darüber wollen wir im folgenden heft näheres mitteilen.

The old idea of discipline and the Montessorian: A Comparison.

by

ANNA MACCHERONI.

This problem of authority has been much discussed. Indeed, the chief mistakes made in the application of the Method are closely bound up with it. The idea of discipline and order has predominance in most schools over that of learning. An almost complete ignorance of the intimate processes by which the intelligence develops and gains fresh knowledge is the result. And yet one goes to school to learn, and it is according to what one is found to have learned that the school confers diplomas. This fundamental mistake includes others. Pedagogy finds herself no more at her ease than authority. She has not had the possibility of showing herself with her own characteristics so clearly distinguishable from all considerations of hygiene, of external order and even of authority!

We have instead a mixture of causes, interests and aims, each in itself good and useful; and this confusion is exemplified in what we may call an "ordinary" or common school, common, that is to all lands and all grades of cultural programmes.

Were we to ask what principle guided the planning out of ordinary school buildings, we should on the best hypothesis be told: "Hygiene"; there must be five metres between floor and ceiling, to allow enough air for 40 or 50 children. Pedagogy would have said: "Leave enough space within the walls for the children to move about!" If we asked: "Why put sometimes 60 or 50, and sometimes only 6 children in a single room?" The answer would be: "It depends on the funds that are available." Now in the Montessori Method, the rôle of the teacher being changed, we are — pedago-

gically — given the number: 35 children (a few more or less do not matter). But in these other schools no pedagogist, to tell the truth, had stated why — psychologically or pedagogically — it was necessary that a child should have comrades at all. This had been treated as a purely materialistic matter. The school costs money, hence the classes must be large. But where the mothers can afford to pay their teachers well — oh! then one can afford to start a class of six children. It is the privilege of Luxury. Let us call it luxurious if we will; let us not call it pedagogical!

If we were to carry our indiscretion further, enquiring: why does the mistress sit in a big chair and hold forth continually? We should be told (or should have been fifty years ago) "Don't bother me! What could I do with 50 small children only anxious to fidget about if I don't keep their attention occupied?"

About 1900 a great novelty was introduced into one of the capitals of Europe. People went into raptures over it! The idea was this. The mistress was to use her left hand so that the children might see it as in a mirror, and imitate with the right. Having placed before each child (immovable in his place) a box, she returned to her desk and began her action. Taking the box in her right hand — the children in their left — she removed the lid with her left hand — the children with their right — She used very marked and definite movements, exaggerating so that they might be clearly realised by the children.

Now in the Montessori Method, too, we have an exact technique. But between this and the case of which we are speaking no comparison is possible; for this mistress was aiming at a collective result, or should we rather say at a fact to be accomplished at the same time and in the same way by *all* the children. There was no question here of a technique protective of the clear working of the intelligence! Instead, it was a matter of protecting external order: discipline!

What a confusion of ideas! A material means of preventing disorder, noise, disorderly activity, mistaken for an intellectual aid to orderly activities.

If one were to ask why the mistress gives collective lessons at

all? One would receive an answer quite foreign to pedagogy. One would be told (or would have been in past years): "Kindly leave me alone. Do you suppose I don't know that it is pleasanter to have to deal with one child instead of 50, of whom there will not be more than two whose brains work alike? As if I didn't know all that! But imagine what the rest would be up to, if I gave up talking to the class and only busied myself with one single child."

Let us dig a little below the surface — only a little — and we shall find that beneath what they call pedagogy lies the anxiety for order, quietness, good behaviour, respect towards school and teacher. We shall find Authority. Authority! The place she has found is no enviable one, oh no! Having no territory of her own, she has encroached on that of pedagogy, occupied it entirely. Like the homeless among mankind, she has made a place for herself — on the top of pedagogy. After all, she could not do anything better, for, as to quitting the school, that was inconceivable. No. Authority is necessary to the school. But her place must be clearly determined and pre-eminent. About 35 years back and during the 15 following years, that is, up to about 1905, I was fortunate enough to visit a large number of schools. I remember the worst of the classes that I saw. The master possessed nothing but his authority; of pedagogy nothing at all. Not that he did not mean well by his class — forty or fifty little boys all in the wildest disorder. He ran from one to the other, taking away a toy from one, from another a pen dripping with ink, profusely perspiring with the failure of his efforts.

I have seen another, and it was the best of those I saw. Here the mistress, small and slight, kept 30 or 40 children quiet, calm and well-behaved, learning quite well what she taught them.

These personal differences between teacher and teacher caused much to be said at that time about "The art of being a Teacher". Books containing practical advice were printed with this title; and this art oscillated between the rights of authority and those of intelligence.

We may consider this period as past and over; one considers a difficulty as surmounted when one has oneself surmounted it; one does not wait for *all* the others to have done so.

The revelations of the Method concerning the natural process of intellectual development have shown that there do exist facts of such a nature that the teacher cannot change them. But intellectual development follows its course; against it, authority can do nothing — be it the authority of a teacher or that of a king. One can merely oppress it, stifle or turn it away, by irritating or disgusting the learner. Take a tiny child of 3 years of age; expect him to concentrate his attention on a long speech made to him. It is no more possible than it would be to make him ride a bicycle.

In the Florence gallery of paintings we may see a picture of Galileo surrounded by his disciples. Great as was the renown of Galileo even in those days, one sees clearly that the interest which lights up the faces of his disciples is no result of his authority. Without doubt, Galileo was showing them some scientific truth with such clearness, that it was the truth itself upon which they gazed. And he, the great Galileo, striving to show it to them, had merely acted so as to make it stand forth before them, clear and bright, bringing them face to face with it, so to say.

All his efforts had been regarding *them* and the *truth*. The master, after preparing the instruments, had remained in the background. He had not shown off before them what he knew nor, if we may put it so, had he tried to acquire more knowledge through them, through their impressions, their views, their mistakes or their powers.

For, were it a matter of saying: The fact occurs as I describe it, I know it and you have merely to remember what I tell you .... why then, we should no longer have a school; we should no longer have to do with a place where the pupil strives to increase his intelligence by the acquiring of new knowledge.

Much is said to day of memorising; one has methods for memorising. Such methods in the school strike me as crutches, given to a child in order that he may not walk on his own feet.

I have seen even in the brief experiment made by Montessori in the teaching of history, such a way of remembering dates as results from a real study of history. But where one prevents the child from learning, when the child or elder boy is expected to

vulgarise the noble path of learning — then we must of course have a calculating machine, a method of memorising.

Amid the confusion of ideas in which Pedagogy lay, owing to the lack of knowledge about inner happenings in the development of the child, this question also arose: that of the duty of learning. How far does this duty extend? In what form shall one apply it in the elementary school? A weighty problem this. And the answer given by the Montessori Method is no less weighty.

A regime of liberty makes a sure and constant appeal to the active and constant coöperation of the will. This will-power we see interesting itself — in an altogether charming manner — in aiding to co-ordinate the movements; in furnishing the intelligence with the occasion of forming its first notions of equality and difference, as regards dimensions, colour, etc., through intellectual exercises. So faithful is the will to its task that by it we have been able in the Method to fix the age when a certain exercise is an intellectual aid; instead of being a fruitless work of superficial acquirements.

But how far will it go? In the free régime of the Method, it is associated with *the needs of the intellectual development.*

If it is corrupted, it may associate itself with the vanities of social life, where a bad doctor is more esteemed than a good workman, and a diplomee from any sort of school counts for more than an able housekeeper.

But if it is protected and preserved from corruption as regards intellectual work, how far will it go? And at what moment will it quit this field of studies to enter on the exploration of higher intellectual activity — whose object is life itself lived with the perfection of inner order? Here we have not only an interesting problem but at the same time a very weighty one.

Before we knew the psychological truth about concentration of attention, we claimed that by imposing it with a command we could enforce this attention collectively, impose it on a whole class. Yet we did not succeed in having, as we have in the Montessori schools, a child so concentrated on his work that he is not distracted by the gaiety of his surroundings, the low windows wide open into the

garden, the mistress, whom he does not see or think of, she having become non-existent for him while he is so concentrated.

Just as long as one continues to esteem one kind of work more than another, preferring the doctor's degree, the diploma of the commercial school, because in commerce or in the learned professions one lives more at one's ease than in the workshop — just so long as one dubs "intelligent" the man who has studied much and lives ill or lives superficially — will one make great mistakes; mistakes even greater than those one made regarding children when one knew so little about them. And it will still be authority that will have the sorry job of condemning to enforced study these young lives with their sturdy strength and intelligence; until what is understood by so few is recognised, and that is: that the natural rôle of intelligence is to direct life along the path of morality and faith, distinguishing between good and ill, between good and better.

Now-a-days we are much concerned about intellectual overwork; but there is another danger in study; whereas overwork wears out the energies, this other danger is that they be thrown off the right track.

We rarely meet in Montessori classes with a child who is disrespectful or really offends against the authority of the mistress. Should there be such, his punishment is in his surroundings — somewhat as it is with a vulgar person in a room filled with well-mannered individuals; he feels out of place. One must clearly distinguish between acts of insubordination. To know how to distinguish will help those who did not understand liberty and confused it with disorder. Now if such persons as we have considered are thought to be "inferior", the "superior" schools will corrupt the will of all those who have by nature a call to high culture, and the will of all those who despise the real foundation of life. The rôle of authority, therefore, has nothing to do with learning, she has to occupy herself with a higher discipline.

A Modification of the Counting Frame.

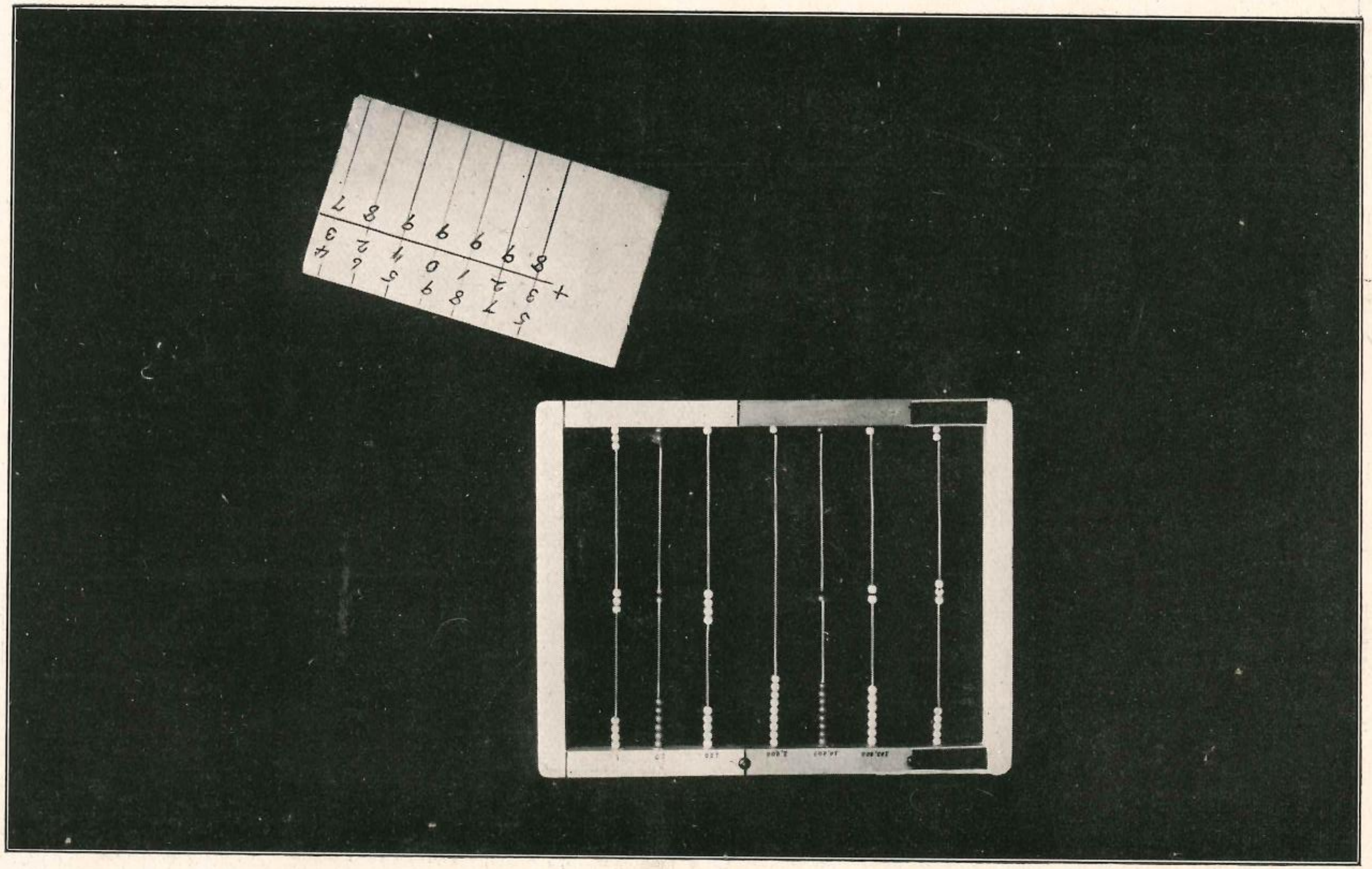
by

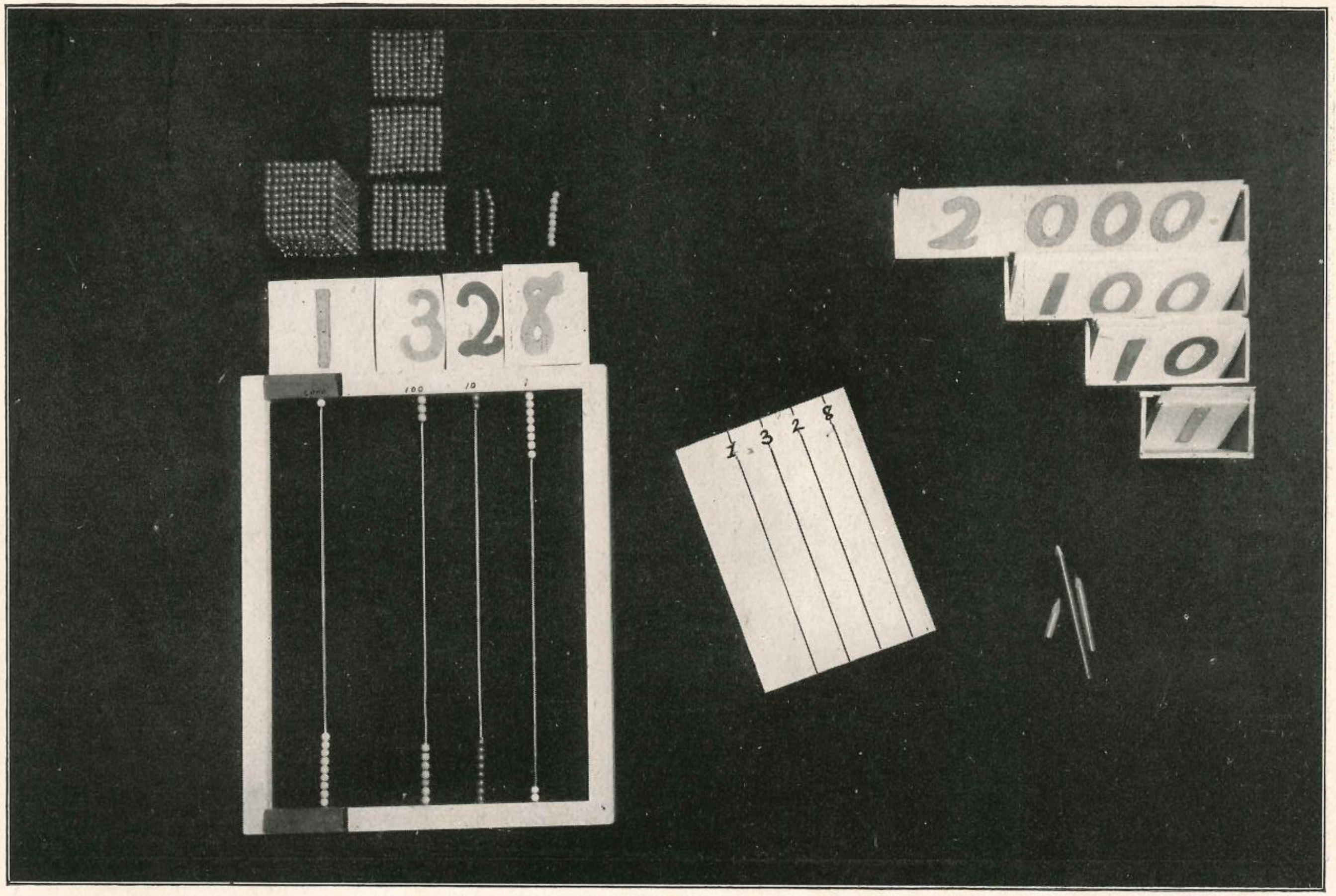
EDITH B. SHREVE.

It is my desire to place at the disposal of other workers the results of an experiment made with a view to determining the value of a modification of Dr. Montessori's counting frame.

The changes made in the apparatus as customarily used were as follows: The support was removed from the back so that the frame could be laid flat on the table. Strips of heavy felt-cloth were glued to the wood on two sides and thus the frame was raised high enough to prevent the beads from touching the table-top as they were moved back and forth on their wires. The most immediate advantage was the elimination of the instability which had caused the frame to fall over when the wind blew or when a table was accidently jarred. This, however, was a minor benefit compared to what soon appeared. Now, the frame could be turned so that the direction of the wires was at right angles to the usual left to right position, with the result that the wires and their beads corres ponded exactly to the number cards, the ruled paper, and the numbers as they are customarily written.

In Fig. 1 may be seen the neat way that a number may be made on the wires, with the separate beads, with the number cards, and on the ruled paper. After a child has finished his first lesson with the frame he takes great delight in making numbers in the four ways. One child told us that she could make her number in five ways. The children who happened to be listening looked puzzled and she explained that she could make it in the four ways that we could see and that in addition she could „think" it. As may be seen in the illustration the number is made at the end of the frame furthest away from the child. He adds numbers to this by pushing up more beads and subtracts by pulling beads toward




1328
100
10
1
1 3 2 8
2000
100
10
1

him. Thus the forms used in the usual operations of addition and subtraction are much better paralleled than was possible with the frame in the old position. Fig. 2 illustrates the process of simple addition on the larger frame. The problem written on the ruled paper was solved on the frame, the sum having been obtained after the beads had been pushed all the way up.

The frames have been used in the new position in the Montessori House of Childhood in San Diego, California, U.S.A., for the past seven months. The ease with which the children have learned the meaning and use of the frame is almost unbelievable. A boy of five years and nine months actually worked out the use of the frame by himself. He had worked patiently and enthusiastically with the bead-chains and number cards until he reached the thousand chain and had even made several numbers beyond one thousand. I had for him number cards which corresponded in position to the wires on the frame as well as to the colors of the beads. He was already familiar with the use of blue for units, gold for tens, etc. He told me that he wanted to try to work out the meaning of the frame without a lesson. He succeeded in obtaining a perfect understanding of it in three-quarters of an hour. Such a radiantly happy child I think I have never seen! A month later a girl of six years had a similar experience. The children who had already used the frames in the old position, observed the changes, selected the frames that had been changed and began to use them in the new position. I have observed no one using a frame in the old position since the first week. The children waited for the changed frames even when the unchanged ones were available. Indeed one child who no longer needs a frame regrets that she did not have the new form because the new position seems „more sensible" to her.

I know of nothing else in all education that gives the child such an opportunity to gain an insight into true mathematical thinking nor anything that makes the understanding of symbolism so easy and delightful, as Dr. Montessori's material for arithmetic. I hope others may find this slight modification of the counting-frame useful. I should be very glad to receive criticism on the modification or tis application.

Question considérant le dessin spontané des enfants.

Quelquefois les petits enfants aiment à dessiner, et quoique à notre idée ces dessins ne soient que des griffonnages au debut ils représentent des personnes, des animaux, des arbres, etc. et notamment ce qui se passe avec ces personnes imaginées ou ce qu'elles font.

Ce dessin spontané, dont les élèves de l'école Cizek à Vienne continuent le développement, nait-il de *l'imagination créatrice*, qu'il faut respecter, et que nous pouvons encourager, ou bien est-ce que cette expression de leur phantaisie, est *déviée, anormale*, et par conséquent nous-est-il permi de la nier, et de l'interrompre, comme nous nions et interrompons les gaspillages d'énergie et les mauvaises habitudes?

Réponse.

Le dessin spontané des enfants est un phénonème très général et que, presque sans exception aucune, on peut constater dès la plus tendre jeunesse. Il n'est en premier lieu et dans la plupart des cas dans aucun rapport avec le don d'artiste de l'enfant, ni avec sa tendance ultérieure aux arts. Il est une des multiples expressions du „moi" de l'enfant tel qui le jeu, son action sur les objects de son entourage, au même titre que toute activité spontanée où l'enfant se manifeste. Et cependant le dessin spontané du petit enfant n'est pas un jeu, — il est bien plus, il est écriture en images et réfléchit les idées de l'enfant sur son ambiance, sur ce qu'il a vécu, et qu'il n'est par encore capable d'exprimer d'une autre facon. Elle réfléchit encore bien des motions bien des tendances latentes dont l'enfant n'a encore aucune conscience.

Le dessin spontané n'est donc ni à considérer comme *l'expression*

d'une phantaisie créatrice, ni comme quelque chose de fautif, de superflu, gaspillage de temps et d'énergie qu'il faudrait réprimer.

L'enfant veut absolument dessiner, qu'il en ait le don ou pas, qu'il réussisse ou non. L'enfant est content si l'objet dessiné exprime, même vaguement, la chose à dire. *Il ne compare pas son dessin avec la réalité.* Il ne vise pas encore à l'esthétique ou à l'imitation, il se contente de parler *sa langue d'images* qu'il est le seul à saisir réellement. Si nous nous mettons à interroger l'enfant sur le contenu du dessin, il nous racontera souvent de longues histoires pour nous faire comprendre ses gribouillages qui sont les symboles de tout un monde d'idées.

Ce n'est qu'à la longue que dans ces hiéroglyphes de l'enfant et suivant les dons et les tendances de chacun d'eux se manifeste pour l'un le plaisir esthétique et la recherche de l'harmonie dans les formes et les couleurs, — pour l'autre la recherche de la précision, des règles et de l'ordre, — pour d'autres encore la volonté de traduire la réalité, de saisir la vie, le mouvement etc. Mais il y a des enfants qui à mesure qu'ils grandissent et que *leur faculté d'expression linguistique et scriptorale* se développe, abondonnent le dessin complètement soit qu'ils ne s'y plaisent pas, soit qu'il n'y aient pas de talent, soit qu'ils soient pris pas des talents d'une toute autre nature. Ainsi par exemple, on constate souvent, que des enfants doués spécialement pour la musique ou qui se prononcent pour les concepts abstraits (mathématiques, logique) ne réussissent pas du tout dans le dessin et l'abandonnent. Un pareil cas a été traité de même au point de vue psychologique, et les dessins, qui y sont donnés mettent la chose bien en évidence quand on compare leur faiblesse avec les compositions musicales géniales, faites dans la même époque par un enfant généralement très intelligent. [1])

Celui qui se mettrait *a réprimer chez l'enfant le dessin spontané agirait donc mal,* vu qu'il réprime ainsi un des *moyens d'expressions* dont dispose l'enfant, qu'il s'est créé lui-même, et dont il a tant besoin. Si plus tard et faisant suite à cette langue en images il s'établit un rapport avec l'art ou que ce rapport ne s'établit pas, —

[1]) G. Révész: The psychology of a Musical Prodigy. London, 1925; Kegan Paul, Trench, Trubner.

de quelle façon cela se fait, voilà des questions à traiter à part.

Mais *les leçons de dessins* peuvent bien être de nature à réprimer ou à faire dévier, voir même étouffer chez l'enfant ces rapports aux arts plastiques surgis spontanément. Il est indéniable que la voie vers l'art doit passer par le dessin spontané.

Une anecdote bien connue, que nous relate Vasari, nous raconte comme quoi Giotto, berger ignorant, greffait des esquisses de ses moutons dans la pierre, et attirait de cette façon sur sa personne l'attention du peintre Cimabue déjà-célèbre. „Si non è vero, è ben trovato!" De pareilles légendes circulent sur le compte de presque tous les grands peintres, et bien rarement on nous cite le cas de génies qui sortent des académies d'art après de longues études, — quoique ce dernier cas soit aussi fréquent que le premier.

Le noyau de verité dans tout cela c'est que le véritable talent se manifestera toujours d'une façon quelconque dans le dessin spontané, — et que les mauvaises leçons de dessin peuvent étouffer ou corrompre dans l'enfant les germes délicats du talent.

Montessori s'est attaquée au problème du dessin à l'école, avec une compréhension parfaite de tout ce que l'âme de l'enfant a de spontané et d'originel. Les enfants peuvent dessiner tant qu'ils veulent, — mais lentement et insensiblement on les achemine vers l'ordre et l'harmonie.

On sait que les petits enfants commencent à l'école Montessori par copier les contours de figures géométriques très simples, — ensuite ils peuvent les remplir de couleurs à volonté. De cette façon on attire leur attention sur la merveilleuse multiplicité et variation des formes régulières (qui se produisent également dans la nature). Ils se sentent attirés de plus en plus, et dans le remplissage en couleurs ils ont l'occasion de manifester leur sens naturel des couleurs. Un facteur psychologique important c'est que l'enfant ne sent pas son impuissance à l'égard de la réalité, qu'aucun modèle qu'aucun exemple de la nature le gêne; — tout enfant sait construire ces figures simples et il ne se lasse pas à reprendre le même modèle avant d'avoir réussi à l'exécuter d'une façon meilleure et plus précise.

Ce qu'il y a encore de bon à ce genre de dessin c'est que les relations qui existent entre l'enfant et son milieu ambiant, ne se

voient pas contraintes ni influencées, ni détraquées (comme cela se fait par un enseignement faux). Le dessin spontané n'est ni contrarié ni réprimé: par là, les deux se développent parallèlement.

Aussi longtemps que l'enfant se contente de ce genre de dessin, il y reste, — mais de plus à plus son regard se raffermit et sa main devient plus habile et plus mobile. Si alors le sens de la réalité s'éveille en lui et s'il s'intéresse à la rendre, il s'y attaque, et à ce moment il dessinera tout aussi spontanément des fleurs et des animaux et d'autres objects de la réalité. Seulement il pourra arriver mieux et avec plus de joie à son but, ayant parcouru tous les excercices préliminaires qu'il fallait, et cela sans leçons de dessin.

J'espère avoir fourni dans ces considérations la réponse à la question posée. Que l'école Montessori ne réprime pas le dessin spontané, qu'elle est plutôt de nature à faire trouver aux enfants dans le dessin spontané leur plus grand plaisir, par le développement libre de leur sens des couleurs et des formes, ainsi que par l'exercice constant de la main et de l'oeil, — que les enfants y arrivent aux meilleurs résultats, — c'est là ce qu'on peut constater aussi dans les dessins d'enfants qu'on a donné en annexes dans chaque numéro de ce périodique et dont chaque école Montessori en possède beaucoup.

Dr. MAGDA RÉVÉSZ—ALEXANDER.

Montessori Nachrichten.

Durch die Unterstützungen, die das Reichsministerium des Innern und der Oberpräsident der Mark Brandenburg, ferner durch den Zuschuss, den das Jugendamt gewährte, ist es möglich geworden das Volkskinderhaus am Leopoldplatz in Berlin zu einem Tagesheim umzuwandeln. Ferner wurde durch die Gemeinde Wilmersdorf bei Berlin für das Kinderhaus I. ein Stück Garten bewilligt.

La Méthode Montessori

au

BRESIL.

Le désir de répandre les modernes idées pédagogiques et d'améliorer les méthodes d'enseignement dans les écoles du Brésil, menèrent le professeur brésilien Alipio Franca à obtenir de la notable Doctoresse Maria Montessori la permission par contrat, pour traduire en langue portugaise le livre: *„La Méthode de la Pédagogie Scientifique", appliqué à l'Education Infantile, dans la „Maison des Enfants".*

La traduction est en voie de publication au Brésil, en l'Etat de Bahia, où demeure Mr. le Professeur Alipio Franca. C'est la première traduction de La Méthode Montessori, en langue portugaise.

MRS. LILY HUTCHINSON.

In Memoriam.

All "Montessorians" know or have heard of Mrs. Hutchinson and will learn with regret of her death. She was born 47 years ago, and gave early evidence of her vocation to the teaching profession. She entered the service of the London County Council, and her great ability, sincerity and high ideals were soon remarked and promotion given. In 1913 the London County Council asked her to go to Rome to study and report on the new revolutionary Education Method—The Montessori Method. She brought back the most convincing reports and immediately introduced the Method into the school at Hoxton (in the East of London). It was difficult at first to get help from the Education Committee for the Montessori apparatus and furniture which is so essential for the right environment, and for a very long time everything necessary for the experiment was paid by Mrs. Hutchinson herself. In spite of the strenuous work a Headmistress has, she lectured all over the country, and when Dr. Montessori in 1919 was invited to give her first Training Course in London she acted as one of her assistants. In addition to her teaching activities she was Corresponding Secretary to the London Montessori Society and was instrumental in forming the Northampton Branch Society. She did a man's share in promoting the Cause and spreading the light of our inspiring Preceptor. Mrs. Hutchinson was of the austere and kindly type of teacher with an indomitable courage and working power. The Montessori Society and the Movement in England has lost a very important helper. May her soul rest in peace.

London, May 1925. C. A. BANG.

THE CALL OF EDUCATION

Edited by Dr. MARIA MONTESSORI

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